San Francisco Planning

49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
628.652.7600
www.sfplanning.org

EXECUTIVE SUMMARY

PUBLIC HEARING ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

HEARING DATE: August 26, 2021

Record No.:	2019-021884ENV
Project Address:	2500 Mariposa Street (SFMTA Potrero Yard Modernization Project)
Zoning:	Public (P) Zoning District 65-X Height and Bulk District
Block/Lot:	3971/001
Project Sponsor:	San Francisco Municipal Transportation Agency 1 South Van Ness Avenue San Francisco, CA 94103
Property Owner:	City & County of San Francisco 1 South Van Ness Avenue, Floor 8 San Francisco, CA 94103
Staff Contact:	Jennifer McKellar – 628-652-7563 CPC.PotreroYardEIR@sfgov.org

Preliminary Recommendation: Review and Comment

Project Description

The proposed project would demolish the existing Potrero Trolley Coach Division Facility (Potrero Yard), a California Register of Historic Resources–eligible historic resource, and replace it with a new transit facility to accommodate the expansion of the SFMTA's transit vehicle fleet. The project would include bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development (residential and commercial) uses as part of a joint development program between SFMTA and a private project co-sponsor. The new, approximately 1,300,000 gross-square-foot structure would rise to heights ranging from 75 to 150 feet across the site. It would contain a three-level, approximately 75-foot-tall replacement transit facility (723,000 gross square feet) plus a joint development with a mix of commercial (33,000 gross square feet) and residential uses (up to 544,000 gross square feet and 575 units). The majority of residential development would be atop the replacement transit facility on floors 7 through 13. The proposed project includes four variants that consider modifications to limited features or aspects of the project: the Emergency Exit Relocation Variant; the

Joint Development Lobby Relocation Variant; the Active 17th Street Variant; and the Employee and Family Support Variant, which would include a child care use.

Required Commission Action

None. The purpose of the public hearing is for the Planning Commission and Planning Department staff to receive comments on the adequacy of the environmental impact report (EIR).

Considerations

A hearing was held before the Historic Preservation Commission on August 4, 2021. At this hearing, the Historic Preservation Commission provided its comments on the Draft EIR. These comments are included below (Exhibit A) along with a copy of the Draft EIR (Exhibit B).

Attachments:

Exhibit A – 2500 Mariposa Street Draft EIR Historic Preservation Commission Comments
Exhibit B – 2500 Mariposa Street Draft EIR

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August 11, 2021

Ms. Lisa Gibson
Environmental Review Officer
San Francisco Planning Department
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103

Dear Ms. Gibson,

On August 4, 2021, the Historic Preservation Commission (HPC) held a public hearing for the commissioners to hear public testimony and to provide comments to the San Francisco Planning Department on the Draft Environmental Impact Report (DEIR) for the proposed 2500 Mariposa Street Project (2019-021884ENV). After discussion, the HPC arrived at the comments below on the DEIR:

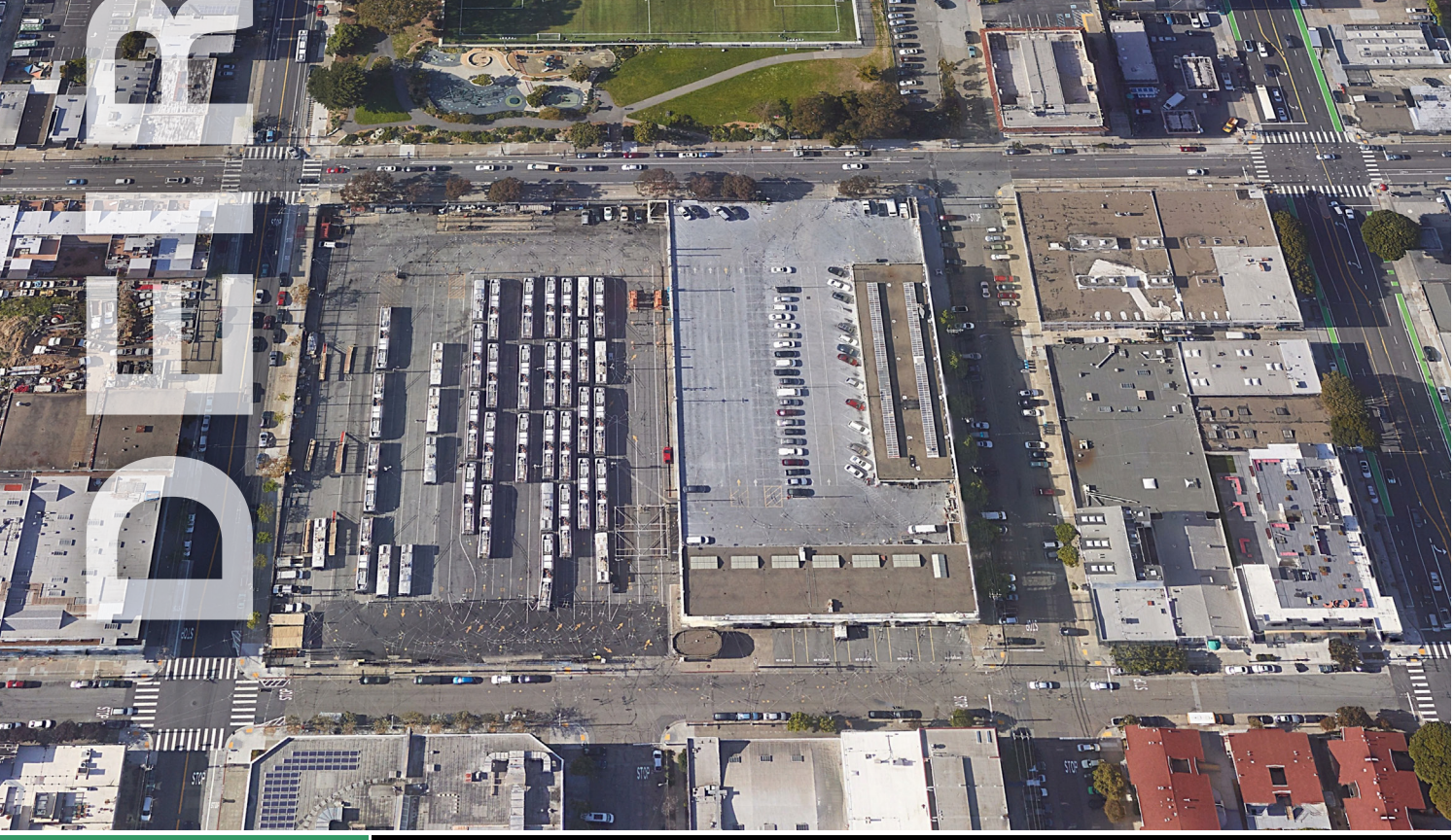
- The HPC found the analysis of historic resources in DEIR to be adequate and accurate. The HPC concurs with the finding that the proposed project would result in a significant, unavoidable impact to the Potrero Trolley Coach Division Facility at 2500 Mariposa Street.
- The HPC found the Mitigation Measures to be adequate but Commission President Matsuda provided some recommendations regarding the oral history and salvage plan mitigation measures. Commission President Matsuda remarked that the oral history mitigation measure specifically mentions interviewing current and former employees. Given the building's longtime existence in the neighborhood, Commission President Matsuda recommended the oral histories also include voices and perspectives from the surrounding community at large. Commission President Matsuda also remarked that the salvage plan mitigation measure is an opportunity to reuse parts of a historic resource in a meaningful way that brings more relevance to the resource. The salvage plan can be a means of making a portion of the resource still present on a day-to-day basis which is important for a building that has been on the site for a long time and has seen multiple uses.
- The HPC agreed that the DEIR analyzed a reasonable and appropriate range of preservation alternatives to address historic resource impacts. The HPC found that the revised alternatives presented in the DEIR addressed their comments from the October 7, 2020 hearing on the draft preservation alternatives. Commissioner So expressed a preference for Alternative C; while Commission President Matsuda acknowledged the merit of Alternative C, she expressed a preference for Alternative B.
- Commission President Matsuda commented in general about the project objectives and noted that the project objectives don't include any mention of retaining the historic resource and remarked that while this was a great project it is important to not only look forward but to also acknowledge our past.

- Commission President Matsuda also commended the project team and planning staff for providing a clear and thoughtful analysis for preservation alternatives in the DEIR.

The HPC appreciates the opportunity to participate in review of this environmental document.

Sincerely,

Diane Matsuda, President
Historic Preservation Commission



DRAFT ENVIRONMENTAL IMPACT REPORT VOLUME 1

Potrero Yard Modernization Project
2500 Mariposa Street

PLANNING DEPARTMENT
CASE NO. **2019-021884ENV**

STATE CLEARINGHOUSE NO. 2020089022

SAN FRANCISCO PLANNING DEPARTMENT

	Draft EIR Publication Date:	**JUNE 30, 2021**
	Draft EIR Public Hearing Date:	**AUGUST 26, 2021**
	Draft EIR Public Comment Period:	**JULY 1, 2021 - AUGUST 31, 2021**

Written and electronic comments should reference the Case No. and be sent to:
Jennifer Barbour McKellar, EIR Coordinator | San Francisco Planning Department
49 South Van Ness Avenue, Suite 1400 | San Francisco, CA 94103
CPC.PotreroYardEIR@sfgov.org

DRAFT ENVIRONMENTAL IMPACT REPORT VOLUME 1

Potrero Yard Modernization Project
2500 Mariposa Street

PLANNING DEPARTMENT
CASE NO. **2019-021884ENV**

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NOTICE OF PUBLIC HEARING

AND AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Hearing Date:	**August 26, 2021**
Time:	**Not before 1:00 PM**
Location:	**Remote or In-person Hearing - Visit https://sfplanning.org/planning-commission for details**
Case Type:	**Environmental (Draft Environmental Impact Report)**
Hearing Body:	**Planning Commission**

PROPERTY INFORMATION		APPLICATION INFORMATION	
Project Address:	2500 Mariposa Street	Case No.:	2019-021884ENV
Cross Street(s):	Mariposa, Hampshire, Bryant, and 17th Streets	Building Permit:	Not filed yet
Block /Lot No.:	3971/001	Applicant/Agent:	San Francisco Municipal Transportation Agency, Licinia Iberri
Zoning District(s):	Public (P) Zoning District 65-X Height and Bulk District	Telephone:	(415) 646-2715
Plan Area:	Mission Area Plan	E-Mail:	Licinia.Iberri@sfmta.com

PROJECT DESCRIPTION

The San Francisco Planning Department has prepared a draft environmental impact report (Draft EIR) in connection with this joint development project that includes public transit and private residential and commercial components. The project is jointly sponsored by the City and County of San Francisco (City) through the San Francisco Municipal Transportation Agency (SFMTA) and the selected development consortium identified through the developer selection process.

The project site is at 2500 Mariposa Street, an approximately 4.4-acre parcel. It is located in San Francisco's Mission District near the South of Market and Potrero Hill neighborhoods (to the north and east, respectively). The project site is owned by the City, through the SFMTA. The proposed project would demolish the Potrero Trolley Coach Division Facility (Potrero Yard) and replace it with a new transit facility to accommodate the expansion of the SFMTA's transit vehicle fleet. The new transit facility would have space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses. The new, approximately 1,300,000-gross-square-foot structure would occupy the site and rise to heights ranging from 75 to 150 feet across the site. It would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the project as part of a joint development program between SFMTA and a private project co-sponsor. The joint development program would include a ground-floor commercial use and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit facility. The majority of residential development would be atop the replacement transit facility on floors 7 through 13.

The proposed project includes four variants that consider modifications to limited features or aspects of the project: the Emergency Exit Relocation Variant, which would relocate the bus emergency exit from 17th Street to Hampshire Street; the Joint Development Lobby Relocation Variant, which would relocate the proposed joint development lobby on Mariposa Street to Hampshire Street; the Active 17th Street Variant, which would relocate internal bus ramps from the north to south sides of the site to allow the mix of joint development uses to be developed along 17th Street; and the Employee and Family Support Variant, which would reprogram a portion of the ground-floor commercial uses to include a child care use.

The project site is included on the following list compiled pursuant to Section 65962.5 of the California Government Code: State Water Resources Control Board Leaking Underground Storage Tank Sites (listed as a "LUST Cleanup Site (Closed)") (Geotracker ID T0607500109) in September 1991 (GeoTracker website accessed March 24, 2021).

DRAFT EIR: The Draft EIR finds that the proposed Potrero Yard Modernization Project at 2500 Mariposa Street would result in the following significant and unavoidable project-level environmental impacts even with mitigation: historical architectural resources and air quality. The Draft EIR provides a detailed project description, an analysis of the physical environmental effects of the project and its variants, and identification of feasible mitigation measures and alternatives that would avoid or lessen the severity of impacts. It is available for public review and comment on the Planning Department's website at http://www.sf-planning.org/sfceqadocs.

The purpose of the public hearing is for the Planning Commission and Planning Department staff to receive comments on the adequacy of the EIR. The Planning Commission will not respond to any of the comments or take action on the project at this hearing. Certification of the Final EIR will take place at a later hearing. Please be advised that due to the COVID-19 emergency, the Planning Commission may conduct this hearing remotely using videoconferencing technology or in-person at City Hall. Additional information may be found on the Planning Department's website or by contacting the planner below. Contact the planner below if you wish to be on the mailing list for future notices.

In addition, there will be a hearing before the Historic Preservation Commission on Wednesday, August 4, 2021 at 12:30 p.m. or later in order for the Historic Preservation Commission to provide its comments on the Draft EIR. Please be advised that due to the COVID-19 emergency, the Planning Commission may conduct this hearing remotely using videoconferencing technology or in-person at City Hall.

Public comments on the Draft EIR will be accepted from July 1, 2021 to 5:00 p.m. on August 31, 2021.

FOR MORE INFORMATION OR TO SUBMIT COMMENTS ON THE EIR, PLEASE CONTACT:

Planner: Jennifer McKellar Telephone: (628) 652-7563

E-Mail: CPC.PotreroYardEIR@sfgov.org

GENERAL INFORMATION ABOUT PROCEDURES

Members of the public are not required to provide personal identifying information when they communicate with the Commission or the Department. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the Department's website or in other public documents.

Only commenters on the Draft EIR will be permitted to file an appeal of the certification of the Final EIR to the Board of Supervisors.

A USB or paper copy of the Draft EIR are available upon request; please contact Jennifer McKellar at **CPC.PotreroYardEIR@sfgov.org** or (628) 652-7563. Written comments should be addressed to Jennifer McKellar, EIR Coordinator, San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103, or emailed to **CPC.PotreroYardEIR@sfgov.org**. Comments received at the public hearing and in writing will be responded to in a Responses to Comments on the Draft EIR document.

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LIST OF FIGURES

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LIST OF ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
AC Transit	Alameda-Contra Costa Transit
ACL	absolute cumulative limit
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AERMOD	U.S. EPA's atmospheric dispersion modeling system
APEZ	Air Pollutant Exposure Zones
AQI	Air Quality Index
ARPP	archeological resource preservation plan
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
California Register	California Register of Historical Resources
CalEEMod	California Emissions Estimator Model
Caltrans	Californian Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
City	City and County of San Francisco
CMP	Congestion Management Plan
CO	carbon monoxide
CO2e	carbon dioxide equivalents
dB	decibel
dBA	decibel a-weighted
DBI	Department of Building Inspection
DEPH	diethylhexyl phthalate
DLOP	Driveway and Loading Operations Plan
DPM	diesel particulate matter
DPR	Department of Parks and Recreation
EIR	Environmental Impact Report
EMFAC	EMission FACtors Model
ERO	Environmental Review Officer
FAR	floor area ratio
FCC	Federal Communications Commission
FTA	Federal Transportation Authority
GGT	Golden Gate Transit
GHG	greenhouse gases
HABS/HALS	Historic American Buildings/Historic American Landscape Survey
HMUPA	Hazardous Materials Unified Program Agency
HPC	Historic Preservation Commission
HRA	health risk assessment
HRE	Historic Resource Evaluation
HRER	Historic Resource Evaluation Response
HVAC	heating, ventilation, and air conditioning
I-80	Interstate 80
I-280	Interstate 280
in/sec	inches per second

L_{90}	sound level exceeded 90 percent of a specified time
lb	pounds
L_{dn}	24-hour sound level metric
LEED	Leadership in Energy and Environmental Design
L_{eq}	equivalent sound level
L_{max}	the instantaneous maximum noise level measured during a defined time interval
LOS	Level of Service
LT	Long-Term
LTS	Less Than Significant
LTSM	Less Than Significant with Mitigation
MEIR	maximally exposed individual resident
MERV	Minimum Efficiency Reporting Value
MMRP	Mitigation Monitoring and Report Program
mph	miles per hour
MTC	Metropolitan Transportation Commission
MTS	Metropolitan Transportation System
Muni	San Francisco Municipal Railway
National Register	National Register of Historic Places
ng/m^3	nanograms per cubic meter
NI	No Impact
NOP	Notice of Preparation
NO_X	oxides of nitrogen
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
OCS	overhead contact system
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
O_3	ozone
P	Public Use (zoning designation)
Pb	lead
PCBs	polychlorinated biphenyls
PDA	priority development area
PDR	production, distribution, and repair
PG&E	Pacific Gas & Electricity
PM	particulate matter
PM_{10}	PM composed of particulates that are 10 microns in diameter or less
$PM_{2.5}$	PM composed of particulates that are 2.5 microns in diameter or less
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
PTR	Preservation Team Review
RMS	root-mean-square
ROG	reactive organic gases
ROSE	Recreational and Open Space Element

RWDI	Rowan William Davies Irwin
RWQCB	Regional Water Quality Control Board
Samtrans	San Mateo County Transit
SB	Senate Bill
SCMs	standard construction measures
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Office
SoMa	South of Market
SO_2	sulfur dioxide
ST	Short-Term
STC	sound transmission class
SU	Significant and Unavoidable
SUD	Special Use District
SUM	Significant and Unavoidable with Mitigation
TACs	toxic air contaminants
TASC	Transportation Advisory Staff Committee
TAAS	Theoretical Annual Available Sunlight
TAZ	transportation analysis zone
TCR	tribal cultural resources
TDM	Transportation Demand Management
TFMP	Transit Fleet Management Plan
TNM	Traffic Noise Model
TNC	transportation network companies
TOG	total organic gases
UMU	Urban Mixed Use (zoning designation)
U.S.C.	United States Code
U.S. EPA	U.S. Environmental Protection Agency
U.S. 101	U.S. Highway 101
VdB	root-mean-square velocity level denoted in the decibel scale
VDECS	Verified Diesel Emission Control Strategies
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WETA	Water Energy Transportation Authority
$\mu g/m^3$	micrograms per cubic meter

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SUMMARY

INTRODUCTION

This document is an environmental impact report (EIR) for the Potrero Yard Modernization Project (proposed project). This summary chapter is intended to highlight major areas of importance in the environmental analysis as required by section 15123 of the California Environmental Quality Act (CEQA) Guidelines. This chapter provides a summary of the proposed project and project variants including a summary list of the San Francisco Public Works Standard Construction Measures (SCMs) incorporated into the proposed project or project variants, a summary of the environmental impacts of the proposed project or project variants, a summary of alternatives to the proposed project or project variants including identification of the environmentally superior alternative, and a summary of environmental issues to be resolved and areas of known controversy.

The summary of the environmental impacts of the proposed project or project variants provides a brief discussion of the date of issuance of the Notice of Preparation (NOP) of an EIR and Notice of a Public Scoping Meeting, the topics analyzed in the EIR and initial study, and the terms used in the EIR to describe the level of significance of impacts. It is followed by a summary table that presents the environmental impacts of the proposed project or project variants identified in the EIR by topic and, where applicable, the corresponding mitigation measures that would reduce or lessen significant impacts (levels of significance are described on p. S.4-S.5). Improvement measures (measures which are not required to mitigate significant impacts but that would further reduce the magnitude of less-than-significant effects) are also identified. The significant impacts identified in the initial study for the proposed project or project variants are listed in a separate summary table, along with the mitigation measures that would reduce them to less-than-significant levels. Following these summary tables is a description of the alternatives to the proposed project or project variants that are addressed in this EIR, a table that compares the characteristics and environmental impacts of those alternatives with those of the proposed project or project variants as well as other project alternatives, and the identification of the environmentally superior alternative.

Table S.1: Summary of Impacts of Proposed Project or Project Variants Identified in the EIR, beginning on p. S.7, and **Table S.2: Summary of Significant Impacts of Proposed Project or Project Variants Identified in the Initial Study**, beginning on p. S.29, provide an overview of the following:

- Environmental impacts with the potential to occur as a result of the proposed project or project variants;
- The level of significance of the environmental impacts before implementation of any applicable mitigation measures;

- Mitigation measures that would avoid or reduce significant environmental impacts;
- Improvement measures that would reduce less-than-significant impacts; and
- The level of significance for each impact after the mitigation measures are implemented.

S.1 PROJECT SYNOPSIS

The project site is at 2500 Mariposa Street (Potrero Yard). It is located in the northeast portion of San Francisco's Mission District near the South of Market and Potrero Hill neighborhoods (to the north and east, respectively). The project site is owned by the City and County of San Francisco (City), through the San Francisco Municipal Transportation Agency (SFMTA). The site is approximately 192,000 square feet (or 4.4 acres) and occupies the equivalent of roughly two typical city blocks (200 by 400 feet). It is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west. The west portion of the site is occupied by a trolley bus storage yard and the east portion by a maintenance and operations building. The maintenance and operations building, originally constructed in 1915, is considered a historical resource for purposes of CEQA. Implementation of the proposed project or project variants would require demolition of the maintenance and operations building, the existing historical architectural resource on the site.

The proposed project would demolish the Potrero Trolley Coach Division Facility (Potrero Yard) and replace it with a new transit facility to accommodate the expansion of the SFMTA's transit vehicle fleet. The new transit facility would have space for bus parking (up to 213 buses) and circulation; SFMTA maintenance, operation, and administrative uses; and joint development uses. The new, approximately 1,300,000-gross-square-foot structure would occupy the 4.4-acre site and rise to heights ranging from 75 to 150 feet across the site. It would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the project as part of a joint development program between the SFMTA (project sponsor and property owner and a private project co-sponsor (developer). Together the SFMTA and the private project co-sponsor will be referenced as the project sponsor team. The joint development program would include a ground-floor commercial use and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit facility. The majority of residential development would be atop the replacement transit facility on floors 7 through 13.

The proposed project includes four variants that consider modifications to limited features or aspects of the project: the Emergency Exit Relocation Variant, which would relocate the bus emergency exit from 17th Street to Hampshire Street; the Joint Development Lobby Relocation Variant, which would relocate a ground-floor joint development lobby from Mariposa Street to Hampshire Street; the Active 17th Street Variant, which would relocate internal bus ramps from the north to south sides of the site to allow the mix of joint development uses to be developed along

17th Street; and the Employee and Family Support Variant, which would reprogram a portion of the ground-floor commercial uses to include a child care use.

Additionally, the project sponsor team would develop a City project where public works would have a role in the oversight of the project construction contracts; therefore, the project would be subject to public works' SCMs.[1] The SCMs listed below would be incorporated as part of the proposed project or project variants and are related to the following environmental resource areas: seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (construction staging), and cultural resources (archaeological and historic architectural resources).

- Public Works Standard Construction Measure #1, Seismic and Geotechnical Studies
- Public Works Standard Construction Measure #2, Air Quality
- Public Works Standard Construction Measure #3, Water Quality
- Public Works Standard Construction Measure #4, Traffic
- Public Works Standard Construction Measure #5, Noise
- Public Works Standard Construction Measure #6, Hazardous Materials
- Public Works Standard Construction Measure #7, Biological Resources
- Public Works Standard Construction Measure #8, Visual and Aesthetic Considerations, Project Site
- Public Works Standard Construction Measure #9, Cultural Resources

EIR Appendix C contains a copy of the SCMs and its attachments. The proposed project or project variants would also be subject to other pertinent City regulations governing construction.

S.2 SUMMARY OF IMPACTS, MITIGATION MEASURES, AND IMPROVEMENT MEASURES

The San Francisco Planning Department (planning department) published an NOP of an Environmental Impact Report and Notice of Public Scoping Meeting on August 19, 2020, announcing its intent to prepare and distribute an EIR (the NOP is presented as **EIR Appendix A**). The planning department prepared an EIR with an initial study (the initial study is presented as **EIR Appendix B**). The initial study found that the proposed project's or project variant's impacts on the environmental topics of Land Use and Planning, Population and Housing, Cultural

[1] San Francisco Municipal Transportation Agency, Memorandum from Jeff Tumlin, Director of Transportation, through Sarah Jones, SFMTA Planning Director and Andrea Contreras, SFMTA Environmental Review Team Lead; to Boris Deunert, San Francisco Public Works Regulatory Affairs Manager, SFMTA Commitment to Public Works Regulatory Affairs QA/QC Implementation Process and Standard Construction Measures, June 15, 2021.

Resources (archaeological resources and human remains), Tribal Cultural Resources, Greenhouse Gas Emissions, Recreation, Utilities and Service Systems, Public Services, Biological Resources, Geology and Soils, Hydrology and Water Quality, Hazards and Hazardous Materials, Energy, Mineral Resources, Agriculture and Forestry Resources, and Wildfire would either have no impact, be less than significant or less than significant with mitigation. The initial study determined that the proposed project or project variants would not have a significant adverse environmental effect relating to these issues and further analysis was not required for these issues.

The initial study found that the topics for which there is the potential for project-specific effects to be significant or for which the analysis requires additional detail are as follows: Cultural Resources (historic architectural resources), Transportation and Circulation (all topics), Noise and Vibration (all topics except aviation-related ones), Air Quality (all topics), Wind, and Shadow. Thus, these topics are included in the EIR.

As described above in Project Synopsis, p. S.2, construction of the proposed project or project variants would be carried out with oversight by public works. Therefore, project construction requires the inclusion of public works' SCMs for the purposes of protecting human health and safety as well as environmental resources. Some of public works' SCMs, listed above and incorporated as part of the proposed project or project variants, would be superseded by project-specific mitigation measures, e.g., **SCM #2, Air Quality**, **Mitigation Measure M-AQ-1: Off-Road Construction Equipment Emissions Minimization**. In addition, some elements of **SCM #9, Cultural Resources**, may not be fully incorporated as a result of project-specific information related to cultural resources, e.g., distance of significant off-site historical resources from construction-related activities on the project site.

All impacts of the proposed project or project variants, associated mitigation measures, and improvement measures identified in this EIR are summarized in **Table S.1: Summary of Impacts of Proposed Project or Project Variants Identified in the EIR**, pp. S.7-S.28. These impacts are listed in the same order as they appear in **EIR Chapter 3, Environmental Setting and Impacts**. The levels of significance of impacts before and after implementation of applicable mitigation measures are identified as:

- **No Impact (NI)** – No adverse changes (or impacts) to the environment are expected.
- **Less Than Significant (LTS)** – Impact that would not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations.
- **Less Than Significant with Mitigation (LTSM)** – Impact that is significant but reduced to a less-than-significant level through implementation of the identified mitigation measure(s).
- **Significant and Unavoidable with Mitigation (SUM)** – Impact that exceeds the defined significance criteria and cannot be reduced to less-than-significant levels through

compliance with existing local, state, and federal laws and regulations and/or implementation of all feasible mitigation measures.

- **Significant and Unavoidable (SU)** – Impact that exceeds the defined significance criteria and cannot be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations, and for which there are no feasible mitigation measures.

Where applicable, **Table S.1** and **Table S.2** identify project conditions, expressed as mitigation measures, that would reduce the identified impact(s) to less-than-significant levels. The impact's level of significance after implementation of the required mitigation measure is provided in the column labeled "Level of Significance after Mitigation." All mitigation measures and improvement measures that are applicable to the proposed project are also applicable to the project variants.

Table S.1 and **Table S.2** should not be relied upon for a thorough understanding of the proposed project or its variants and their associated impacts and mitigation needs; it is presented for the reader as an overview of impacts, mitigation measures, and improvement measures of the proposed project or project variants. Please see the relevant environmental topic sections in **EIR Chapter 3, Environmental Setting and Impacts**, and the initial study, **Section E, Evaluation of Environmental Effects** (**EIR Appendix B**) for a thorough discussion and analysis of project-level and cumulative environmental impacts and the mitigation measures identified to address those impacts, as well as the basis for any proposed improvement measures.

As described below in **Table S.1**, this EIR identifies two significant and unavoidable impacts even with incorporation of mitigation. As discussed in **EIR Section 3.B, Cultural Resources**, project impacts related to historic architectural resources would remain even with mitigation because the proposed project or project variants would demolish the existing historic building and would:

- Materially alter, in an adverse manner, the physical characteristics of the Potrero Trolley Coach Division Facility that justify its inclusion in the California Register of Historic Resources.

As discussed in **EIR Section 3.E, Air Quality**, although project impacts related to the exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure under project and cumulative conditions were determined to be less than significant with mitigation, there is uncertainty regarding the health risk from construction activities due to the potential for changes to the off-road equipment roster and intensity of average daily use of the various pieces of off-road equipment. Therefore, the significant and unavoidable project and cumulative health risk air quality impacts would remain even with mitigation because the proposed project or project variants would:

- Generate emissions of toxic air contaminants, including diesel particulate matter, total organic gases, and particulate matter (2.5 microns), at levels which would result in an exceedance of the health protective risk exposure level for sites within a mapped air quality exposure zone that is also within a health vulnerable zip code.

Implementation of **Mitigation Measures M-CR-1a: Documentation of Historical Resource, M-CR-1b: Salvage Plan, M-CR-1c: Interpretation of the Historical Resource, and M-CR-1d: Oral Histories**, pp. 3.B.29-3.B.32, would lessen the impact of the proposed project or project variants; however, implementation of these mitigation measures would not reduce this significant impact to a less-than-significant level. Therefore, this impact would be considered significant and unavoidable with mitigation.

Implementation of **Mitigation Measure M-AQ-1: Off-Road Construction Emissions Minimization Plan**, along with **Mitigation Measure M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan**, would lessen the construction- and operation-related contributions of the proposed project or project variants to the exposure of sensitive receptors to substantial pollutant concentrations resulting excess cancer health risk exposure. However, implementation of **Mitigation Measure M-AQ-1** would not reduce the construction-related contribution substantially enough below the threshold of significance. Therefore, this impact was determined to be significant and unavoidable with mitigation.

The initial study identified topics that were determined not to apply to the proposed project or project variants and topics where the proposed project or project variants would have no impact, a less-than-significant impact, or an impact that would be less-than-significant with mitigation. For potentially significant impacts, mitigation measures are identified that would reduce these impacts to a less-than-significant level. As shown in **Table S.2: Summary of Significant Impacts of Proposed Project or Project Variants Identified in the Initial Study**, beginning on pp. S.29, the initial study identified significant impacts related to tribal cultural resources and to geology and soils (paleontology) that would be reduced to less-than-significant levels with implementation of the mitigation measures identified.

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Table S.1: Summary of Impacts of Proposed Project or Project Variants Identified in the EIR

Impact	Level of Significance before Mitigation	Mitigation and Improvement Measures	Level of Significance after Mitigation
Legend: NI = No Impact; LTS = Less than significant or negligible impact, no mitigation required; S = Significant; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable			
EIR Section 3.B, Cultural Resources (Historic Architectural Resources)			
CR-1: The proposed project or project variants would cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5 of the CEQA Guidelines.	S	**Mitigation Measures M-CR-1a: Documentation of Historical Resource (HRER Part II, Mitigation Measure 1)** Prior to issuance of a demolition permit, the project sponsor team shall undertake Historic American Building/Historic American Landscape Survey-like (HABS/HALS-like) documentation of the building features. The documentation shall be undertaken by a professional who meets the Secretary of the Interior's Professional Qualifications Standards for Architectural History, History, or Architecture (as appropriate) to prepare written and photographic documentation of the Potrero Trolley Coach Division Facility. The specific scope of the documentation shall be reviewed and approved by the Planning Department but shall include the following elements: **Measured Drawings** – A set of measured drawings shall be prepared that depict the existing size, scale, and dimension of the historic resource. Planning Department staff will accept the original architectural drawings or an as-built set of architectural drawings (e.g., plans, sections, elevations). Planning Department staff will assist the consultant in determining the appropriate level of measured drawings. **Historic American Buildings/Historic American Landscape Survey-Level Photographs** – Either Historic American Buildings/Historic American Landscape Survey (HABS/HALS) standard large-format or digital photography shall be used. The scope of the digital photographs shall be reviewed by Planning Department staff for concurrence, and all digital photography shall be conducted according to the latest National Park Service (NPS) standards. The photography shall be undertaken by a qualified professional with demonstrated experience in HABS/HALS photography. Photograph views for the data set shall include contextual views; views of each side of the building and interior views, including	SUM

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		any original interior features, where possible; oblique views of the building; and detail views of character-defining features. All views shall be referenced on a photographic key. This photographic key shall be on a map of the property and shall show the photograph number with an arrow to indicate the direction of the view. Historic photographs shall also be collected, reproduced, and included in the data set. **HABS/HALS Historical Report** – A written historical narrative and report shall be provided in accordance with the HABS/HALS Historical Report Guidelines. The written history shall follow an outline format that begins with a statement of significance supported by the development of the architectural and historical context in which the structure was built and subsequently evolved. The report shall also include architectural description and bibliographic information. **Video Recordation (HRER Part II, Mitigation Measure 3)** – Video recordation shall be undertaken before demolition or site permits are issued. The project sponsor team shall undertake video documentation of the affected historical resource and its setting. The documentation shall be conducted by a professional videographer, one with experience recording architectural resources. The documentation shall be narrated by a qualified professional who meets the standards for history, architectural history, or architecture (as appropriate) set forth by the Secretary of the Interior's Professional Qualification Standards (36 Code of Federal Regulations Part 61). The documentation shall include as much information as possible—using visuals in combination with narration—about the materials, construction methods, current condition, historic use, and historic context of the historical resource. This mitigation measure would supplement the traditional HABS/HALS documentation, and would enhance the collection of reference materials that would be available to the public and inform future research. **Softcover Book** – A Print-on-Demand softcover book shall be produced that includes the content from the historical report, historical photographs,	

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		HABS/HALS photography, measured drawings, and field notes. The Print-on-Demand book shall be made available to the public for distribution. The project sponsor team shall transmit such documentation to the History Room of the San Francisco Public Library, San Francisco Architectural Heritage, the Planning Department, and the Northwest Information Center. The HABS/HALS documentation scope will determine the requested documentation type for each facility, and the project sponsor team will conduct outreach to identify other interested groups. All documentation will be reviewed and approved by the Planning Department's staff before any demolition or site permit is granted for the affected historical resource. **Mitigation Measure M-CR-1b: Salvage Plan (HRER Part II, Mitigation Measure 2)** Prior to any demolition that would remove character-defining features, the project sponsor team shall consult with the planning department as to whether any such features may be salvaged, in whole or in part, during demolition/alteration. The project sponsor team shall make a good faith effort to salvage materials of historical interest to be utilized as part of the interpretative program. **Mitigation Measure M-CR-1c: Interpretation of the Historical Resource (HRER Part II, Mitigation Measure 4)** The project sponsor team shall facilitate the development of an interpretive program focused on the history of the project site. The interpretive program should be developed and implemented by a qualified professional with demonstrated experience in displaying information and graphics to the public in a visually interesting manner, such as a museum or exhibit curator. This program shall be initially outlined in a proposal for an interpretive plan subject to review and approval by Planning Department staff. The proposal shall include the proposed format and the publicly-accessible location of the interpretive content, as well as high-quality graphics and written narratives. The proposal prepared by the qualified consultant describing the general parameters of the interpretive program	

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		shall be approved by Planning Department staff prior to issuance of the architectural addendum to the site permit. The detailed content, media, and other characteristics of such an interpretive program shall be approved by Planning Department staff prior to issuance of a Temporary Certificate of Occupancy. The interpretative program shall include but not be limited to the installation of permanent on-site interpretive displays or screens in publicly accessible locations. Historical photographs, including some of the large-format photographs required by Mitigation Measure M-CR-1a, may be used to illustrate the site's history. The oral history program required by Mitigation Measure M-CR-1d will also inform the interpretative program. The primary goal is to educate visitors and future residents about the property's historical themes, associations, and lost contributing features within broader historical, social, and physical landscape contexts. These themes would include but not be limited to the subject property's historic significance for its association with the earliest years of San Francisco's Municipal Railway, the United States' first publicly owned street railway and for its distinctive characteristics as a car barn, for its post-Earthquake period of construction, and as the work of master Michael M. O'Shaughnessy. **Mitigation Measure M-CR-1d: Oral Histories (HRER Part II, Mitigation Measure 5)** The project sponsor team shall undertake an oral history project on the resource that may include interviews of people such as former employees. The project shall be conducted by a professional historian in conformance with the Oral History Association's Principles and Best Practices (https://www.oralhistory.org/principles-and-best-practices-revised-2018/). In addition to transcripts of the interviews, the oral history project shall include a narrative project summary report containing an introduction to the project, a methodology description, and brief summaries of each conducted interview. Copies of the completed oral history project shall be submitted to the San Francisco Public	

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		Library, Planning Department, and other interested historical institutions. The oral history project shall also be incorporated into the interpretative program.	
CR-2: Construction of the proposed project or project variants would not materially alter, in an adverse manner, the physical characteristics of any off-site historical resource that justifies its inclusion in the California Register of Historical Resources.	LTS	No mitigation measures are required.	N/A
C-CR-1: The proposed project or project variants, in combination with cumulative projects, would not materially alter, in an adverse manner, the physical characteristics of historical resources that justify their eligibility for inclusion in the California Register of Historical Resources, resulting in a cumulative impact.	LTS	No mitigation measures are required.	N/A
EIR Section 3.C, Transportation and Circulation			
TR-1: Construction of the proposed project or project variants would not require a substantially extended duration or intense activity and the secondary effects would not create potentially hazardous conditions for	LTS	**Improvement Measure I-TR-A: Construction Management Plan – Additional Measures** As part of the project's construction management plan, the SFMTA and a private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) will require additional measures to further minimize	N/A

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people walking, bicycling, or driving; or interfere with accessibility for people walking or bicycling; or substantially delay public transit.		disruptions to people walking and bicycling, transit, and emergency vehicles during project construction: The additional measures include: • *Carpool, Bicycle, Walk, and Transit Access for Construction Workers*—To minimize parking demand and vehicle trips associated with construction workers, the construction contractor will include as part of the Construction Management Plan methods to encourage carpooling, bicycle, walk, and transit access to the project site by construction workers. These methods could include providing secure bicycle parking spaces, participating in free-to-employee and employer ride matching program from www.511.org, participating in emergency ride home program through the City of San Francisco (www.sferh.org), and providing transit information to construction workers. • *Project Construction Updates for Adjacent Businesses and Residents*—To minimize construction impacts on access to nearby residences and businesses, the project sponsor team will provide nearby residences and adjacent businesses with regularly updated information regarding project construction, including construction activities, peak construction vehicle activities, travel lane closures, and parking lane and sidewalk closures (e.g., via the project's website). At regular intervals to be defined in the construction management plan, a regular email notice will be distributed by the project sponsor team that would provide current construction information of interest to neighbors, as well as contact information for specific construction inquiries or concerns.	
TR-2: Operation of the proposed project or project variants would not create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations	LTS	No mitigation measures are required.	N/A

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TR-3: Operation of the proposed project or project variants would not interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access.	LTS	No mitigation measures are required.	N/A
TR-4: Operation of the proposed project or project variants would not substantially delay public transit.	LTS	No mitigation measures are required.	N/A
TR-5: Operation of the proposed project or project variants would not cause substantial additional VMT or substantially induce automobile travel.	LTS	No mitigation measures are required.	N/A
TR-6: Operation of the proposed project or project variants would not result in a loading deficit.	LTS	**Improvement Measure I-TR-B: Driveway and Loading Operations Plan (DLOP)** The project sponsor team will be required to prepare and implement a Driveway and Loading Operations Plan (DLOP). The DLOP will be prepared by the private project co-sponsor, in coordination with the SFMTA, and submitted as part of the application for the first temporary occupancy permit. The DLOP will include provisions to manage loading activities and driveway operations associated with the below-grade onsite loading spaces; provisions for assessing on-street commercial and passenger loading supply and protocol for expanding on-street supply, if needed; provisions for trash/recycling/compost truck access and collection operations; provisions for residential move-in and move-out operations; provisions for scheduling Muni deliveries using the onsite loading facilities; and	N/A

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		provisions for accommodating recurring deliveries such as UPS, Federal Express, and USPS within the onsite loading facilities. The intent of the DLOP is to reduce potential conflicts between passenger and freight loading and transit operations, and between passenger and freight loading activities and people walking and bicycling, and other vehicles in the project vicinity, as well as to maximize reliance on onsite facilities to accommodate freight loading demand.	
C-TR-1: The proposed project or project variants, in combination with cumulative projects, would not result in significant construction-related transportation impacts.	LTS	**Improvement Measure I-TR-A**, above, would apply to this cumulative impact.	N/A
C-TR-2: The proposed project or project variants, in combination with cumulative projects, would not create potentially hazardous conditions.	LTS	No mitigation measures are required.	N/A
C-TR-3: The proposed project or project variants, in combination with cumulative projects, would not interfere with accessibility.	LTS	No mitigation measures are required.	N/A
C-TR-4: The proposed project or project variants, in combination with cumulative projects, would not substantially delay public transit.	LTS	No mitigation measures are required.	N/A

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C-TR-5: The proposed project or project variants, in combination with cumulative projects, would not cause substantial additional VMT or substantially induce automobile travel.	LTS	No mitigation measures are required.	N/A
C-TR-6: The proposed project or project variants, in combination with cumulative projects, would not result in significant loading impacts.	LTS	No mitigation measures are required.	N/A
EIR Section 3.D, Noise and Vibration			
NO-1: Construction of the proposed project or project variants would generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the San Francisco Noise Ordinance or applicable standards of other agencies.	S	**Mitigation Measure M-NO-1: Construction Noise Control** The SFMTA and private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall prepare construction noise control documentation as detailed below. Prior to issuance of any demolition or building permit, the project sponsor team shall submit a project-specific construction noise control plan to the Environmental Review Officer (ERO) or the ERO's designee for approval. The construction noise control plan shall be prepared by a qualified acoustical engineer, with input from the construction contractor, and include all feasible measures to reduce construction noise. The construction noise control plan shall identify noise control measures to meet a performance target of construction activities not resulting in a noise level greater than 90 dBA at noise-sensitive receptors and 10 dBA above the ambient noise level at noise-sensitive receptors. The project sponsor team shall ensure that requirements of the construction noise control plan are included in contract specifications. If nighttime construction is required, the plan shall include specific measures to reduce nighttime construction noise. The plan shall also	LTSM

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		include measures for notifying the public of construction activities, complaint procedures, and a plan for monitoring construction noise levels in the event complaints are received. The construction noise control plan shall include the following measures to the degree feasible, or other effective measures, to reduce construction noise levels: • Use construction equipment that is in good working order, and inspect mufflers for proper functionality; • Select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures); • Use construction equipment with lower noise emission ratings whenever possible, particularly for air compressors; • Prohibit the idling of inactive construction equipment for more than five minutes; • Locate stationary noise sources (such as compressors) as far from nearby noise-sensitive receptors as possible, muffle such noise sources, and construct barriers around such sources and/or the construction site. • Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (as determined by the acoustical engineer) immediately adjacent to neighbors. • Enclose or shield stationary noise sources from neighboring noise-sensitive properties with noise barriers to the extent feasible. To further reduce noise, locate stationary equipment in pit areas or excavated areas, if feasible; and • Install temporary barriers, barrier-backed sound curtains and/or acoustical panels around working powered impact equipment and, if necessary, around the project site perimeter. When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be	

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		closed with material that completely closes the gaps, and dense enough to attenuate noise. The construction noise control plan shall include the following measures for notifying the public of construction activities, complaint procedures, and monitoring construction noise levels: • Designate an on-site construction noise manager for the project; • Notify neighboring noise-sensitive receptors within 300 feet of the project construction area at least 30 days in advance of high-intensity noise-generating activities (e.g., pier drilling, pile driving, and other activities that may generate noise levels greater than 90 dBA at noise-sensitive receptors) about the estimated duration of the activity; • Post a sign onsite describing noise complaint procedures and a complaint hotline number that shall always be answered during construction; • Implement a procedure for notifying the planning department of any noise complaints within one week of receiving a complaint; • Establish a list of measures for responding to and tracking complaints pertaining to construction noise. Such measures may include the evaluation and implementation of additional noise controls at sensitive receptors (residences, hospitals, convalescent homes, schools, churches, hotels and motels, and sensitive wildlife habitat); and • Conduct noise monitoring (measurements) at the beginning of major construction phases (e.g., demolition, grading, excavation) and during high-intensity construction activities to determine the effectiveness of noise attenuation measures and, if necessary, implement additional noise control measures.	

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		The construction noise control plan shall include the following additional measures in the event of pile-driving activities: • When pile driving is to occur within 600 feet of a noise-sensitive receptor, implement "quiet" pile-driving technology (such as pre-drilling of piles, sonic pile drivers, auger cast-in-place, or drilled-displacement, or the use of more than one pile driver to shorten the total pile-driving duration [only if such measure is preferable to reduce impacts to sensitive receptors]) where feasible, in consideration of geotechnical and structural requirements and conditions; • Where the use of driven impact piles cannot be avoided, properly fit impact pile driving equipment with an intake and exhaust muffler and a sound-attenuating shroud, as specified by the manufacturer; and • Conduct noise monitoring (measurements) before, during, and after the pile-driving activity.	
NO-2: Construction of the proposed project or project variants would generate excessive groundborne vibration or groundborne noise levels.	S	**Mitigation Measure M-NO-2: Vibration-Sensitive Equipment at 2601 Mariposa Street (KQED Building)** Prior to construction, the SFMTA and private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall designate and make available a community liaison to respond to vibration complaints from building occupants at the KQED building, located at 2601 Mariposa Street. Contact information for the community liaison shall be posted in a conspicuous location so that it is clearly visible to building occupants most likely to be disturbed. Through the community liaison, the project sponsor team shall provide notification to property owners and occupants of 2601 Mariposa Street at least 10 days prior to construction activities involving equipment that can generate vibration capable of interfering with vibration-sensitive equipment, informing them of the estimated start date and duration of vibration-generating construction activities. Equipment types capable of generating such vibration include an impact	LTSM

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		pile driver, or similar equipment, operating within 250 feet of the building or a vibratory roller, or similar equipment, operating within 125 feet of the building. If feasible, the project sponsor team shall identify potential alternative equipment and techniques that could reduce construction vibration levels. Alternative equipment and techniques may include, but are not limited to: • pre-drilled piles, • caisson drilling, • oscillating or rotating pile installation, • jetting piles into place using a water injection at the tip of the pile could be substituted for driven piles, if feasible, based on soil conditions, • static rollers could be substituted for vibratory rollers in some cases. If concerns prior to construction or complaints during construction related to equipment interference are identified, the community liaison shall work with the project sponsor team and the affected building occupants to resolve the concerns such that the vibration control measures would meet a performance target of the 65 VdB vibration level threshold for vibration sensitive equipment, as set forth by Federal Transit Authority (FTA). To resolve concerns raised by building occupants, the community liaison shall convey the details of the complaint(s) to the project sponsor team, such as who shall implement specific measures to ensure that the project construction meets the performance target of 65 VdB vibration level for vibration sensitive equipment. These measures may include evaluation by a qualified noise and vibration consultant, scheduling certain construction activities outside the hours of operation or recording periods of specific vibration-sensitive equipment if feasible, and/or conducting ground-borne vibration monitoring to document that the project can meet the performance target of 65 VdB at specific distances and/or locations. Ground-borne vibration monitoring, if appropriate to resolve concerns, shall be conducted by a qualified noise and vibration consultant.	

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NO-3: Operation of the proposed project or project variants would generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan, or applicable standards of other agencies.	S	**Mitigation Measure NO-3: Fixed Mechanical Equipment Noise Control for Building Operations** The SFMTA and a private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall prepare operational noise control documentation as detailed below. Prior to approval of a building permit, the project sponsor team shall submit documentation to the Environmental Review Officer (ERO) or the officer's designee, demonstrating with reasonable certainty that the building's fixed mechanical equipment (such as heating, ventilation and air conditioning [HVAC] equipment) meets the noise limits specified in sections 2909 (b) and 2909 (d) of the noise ordinance (i.e., an 8-dB increase above the ambient noise level at the property plane for commercial or mixed-use properties; and interior noise limits of 55 dBA and 45 dBA for daytime and nighttime hours inside any sleeping or living room in a nearby dwelling unit on a residential property assuming windows open, respectively). Acoustical treatments required to meet the noise ordinance may include, but are not limited to: • Enclosing noise-generating mechanical equipment; • Installing relatively quiet models of air handlers, exhaust fans, and other mechanical equipment; • Using mufflers or silencers on equipment exhaust fans; • Orienting or shielding equipment to protect noise-sensitive receptors (residences, hospitals, convalescent homes, schools, churches, hotels and motels, and sensitive wildlife habitat) to the greatest extent feasible; • Increasing the distance between noise-generating equipment and noise-sensitive receptors; and/or • Placing barriers around the equipment to facilitate the attenuation of noise.	LTSM

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		Compliance with this fixed-mechanical equipment noise control for building operations standard requirement does not obviate the need for the equipment to demonstrate compliance with the noise ordinance throughout the lifetime of the project.	
C-NO-1: Construction noise as a result of the proposed project or project variants, combined with construction noise from cumulative projects in the vicinity, would cause a substantial temporary increase in ambient noise levels.	S	**Mitigation Measure NO-1**, above, would apply to this cumulative impact.	LTSM
C-NO-2: Construction vibration as a result of the proposed project or project variants, combined with construction vibration from cumulative projects in the vicinity, would not generate excessive groundborne vibration or groundborne noise levels.	LTS	No mitigation measures are required.	N/A
C-NO-3: Operation of the proposed project or project variants, combined with operation noise from cumulative projects in the vicinity, would cause a substantial permanent increase in ambient noise levels in the project vicinity.	LTS	No mitigation measures are required.	N/A

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EIR Section 3.E, Air Quality			
AQ-1: During construction, the proposed project or project variants would not generate significant fugitive dust emissions, but would generate criteria air pollutant emissions at levels which would result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.	S	**Mitigation Measure M-AQ-1: Off-Road Construction Equipment Emissions Minimization.** The SFMTA and private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall comply with the following: (A) Engine Requirements. (1) All off-road equipment greater than or equal to 25 horsepower shall have engines that meet U.S. EPA or California Air Resources Board Tier 4 Final off-road emission standards. (2) Where access to alternative sources of power is available, portable diesel engines shall be prohibited. If access to alternative sources of power is infeasible, portable diesel engines shall meet the requirements of Subsection (A)(1). (3) Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than two minutes, at any location, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment (e.g., traffic conditions, safe operating conditions). The project sponsor team shall post legible and visible signs in English, Spanish, and Chinese, in designated queuing areas and at the construction site to remind operators of the two-minute idling limit. (4) The project sponsor team shall instruct construction workers and equipment operators on the maintenance and tuning of construction equipment and require that such workers and operators properly maintain and tune equipment in accordance with manufacturer specifications.	LTSM

		(B) Waivers. (1) The San Francisco Planning Department Environmental Review Officer (ERO) may waive the equipment requirements of Subsection (A)(1) if: a particular piece of off-road Tier 4 Final equipment is not regionally available, not technically feasible, or would not produce desired emissions reduction due to expected operating modes. In granting the waiver, the project sponsor team must demonstrate with substantial evidence that the project construction does not exceed the BAAQMD threshold for NOx (54 lbs/day) by resulting in a net increase of average daily NOx emissions greater than 4 pounds per day. The project sponsor team must also demonstrate with substantial evidence that the overall combined construction and operational excess cancer risk does not exceed 7 per 1 million persons exposed at nearby sensitive receptors. (C) Construction Emissions Minimization Plan. (1) Before starting onsite construction activities, the project sponsor team shall submit a Construction Emissions Minimization Plan (Plan) to the ERO for review and approval. The Plan shall state, in reasonable detail, how the project sponsor team will meet the requirements of Section A. (2) The Plan shall include estimates of the construction timeline by phase, with a description of each piece of off-road equipment required for every construction phase. The description may include, but is not limited to: equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel use and hours of operation. (3) The project sponsor team shall ensure that all applicable requirements of the Plan have been incorporated into the contract specifications. The Plan shall include a certification statement that the project sponsor team agrees to comply fully with the Plan. (4) The project sponsor team shall make the Plan available to the public for review onsite during working hours. The project sponsor team shall post at the construction site a legible and visible sign summarizing the Plan. The sign shall also state that the public may ask to inspect the Plan for the project at any time during working hours and shall explain how to request to inspect the Plan. The project sponsor team shall post at least	

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		one copy of the sign in a visible location on each side of the construction site facing a public right-of-way. (D) Monitoring (1) After start of construction activities, the project sponsor team shall submit biannual reports to the ERO documenting compliance with the Plan. After completion of construction activities and prior to receiving a final certificate of occupancy, the project sponsor team shall submit to the ERO a final report summarizing construction activities, including the start and end dates and duration of each construction phase, and the specific information required in the Plan.	
AQ-2: During operation, the proposed project or project variants would generate criteria air pollutant emissions at levels that would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.	LTS	No mitigation measures are required.	N/A
AQ-3: Construction and operation of the proposed project or project variants would generate toxic air contaminants, including diesel particulate matter, at levels which would expose sensitive receptors to substantial pollutant concentrations.	S	**Mitigation Measure M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan** The SFMTA and private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as the project sponsor team) shall comply with the following: 1. Require all emergency diesel generators to meet Tier 4 Final emission standards, reduce annual testing limit to 20 hours per year for each generator, and vent generator exhaust above the 75-foot roofline of the project building; or	SUM

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		2. Require all emergency diesel generators to meet Tier 4 Final emission standards, reduce annual testing limit to 20 hours per year for each generator, and vent generator exhaust on the west or north side of the project building; or 3. Require all emergency generators to be battery-powered; or 4. The project sponsor team shall retain a qualified air quality consultant to develop an Emergency Diesel Generator Health Risk Reduction Plan. The project sponsor team shall submit the plan to the San Francisco Planning Department Environmental Review Officer (ERO) for review and approval prior to issuance of a permit for emergency diesel generators from the San Francisco Department of Building Inspection or the Bay Area Air Quality Management District. The plan must include, for each emergency diesel generator, a description of the anticipated venting location, engine specifications, and annual maintenance testing procedures. The plan must demonstrate with substantial evidence that annual maintenance testing will not result in the project's overall construction and operational cancer risk exceeding 7 per one million persons exposed at nearby offsite sensitive receptors. Additionally, the operator of the facility at which the generators are located shall be required to maintain records of the testing schedule for each emergency diesel generator for the life of that generator and to provide this information for review to the planning department within three months of requesting such information. **Mitigation Measure M-AQ-1** would also apply to this impact.	
AQ-4: The proposed project or project variants would not conflict with implementation of the 2017 Bay Area Clean Air Plan.	LTS	No mitigation measures are required.	N/A

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AQ-5: The proposed project or project variants would not create objectionable odors that would affect a substantial number of people.	LTS	No mitigation measures are required.	N/A
C-AQ-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would contribute considerably to cumulative health risk impacts on sensitive receptors.	S	**Mitigation Measures M-AQ-1** and **M-AQ-3**, above, would apply to this cumulative impact.	SUM
EIR Section 3.F, Wind			
WI-1: The proposed project or project variants would create wind hazards in publicly accessible areas of substantial pedestrian use in the vicinity of the project site.	S	**Mitigation Measure M-WI-1: Design Measures to Reduce Project-Specific Wind Impacts** The project sponsor team shall retain a qualified wind consultant to prepare, in consultation with the San Francisco Planning Department (planning department), a wind impact mitigation report that identifies design measures to reduce the project's wind impacts in the project scenario. Prior to certification of the Final Environmental Impact Report, the project sponsor team shall submit the wind impact mitigation report to the planning department for its final review and approval. The wind impact mitigation report shall incorporate updated information on the building design based on a list of potential wind reduction measures identified below, along with the estimated effectiveness of each measure to reduce the identified off-site wind hazards. • Porous façades on portions of the north, east and west sides for natural ventilation as part of the heating, ventilation, and air conditioning strategy for the new transit facility at the second and third levels	LTSM

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		• Recessed building corner up to 12 feet in height at the southwest corner of proposed building near Bryant/Mariposa intersection • Vertical elevated screens on portions of the second and third levels of the west façade (Bryant Street) • Vertical wind screens at grade level on the adjacent Bryant Street sidewalk near the Bryant/Mariposa intersection Such wind reduction design measures may include additional on-site landscaping, or equivalent wind-reducing features; and off-site wind reduction measures such as landscaping, streetscape improvements or other wind-reducing features, such as wind screens. The project sponsor team shall implement as many of the design measures identified in the wind impact mitigation report as needed to reduce the proposed project's or project variants' potential to create a new wind hazard or exacerbate an existing wind hazard in publicly accessible areas of substantial pedestrian use to less-than-significant levels. The final wind impact mitigation report should not find that the project produces a net increase of the already identified wind hazard exceedances. The planning department shall approve the final list of wind reduction measures that the project sponsor team shall implement.	
C-WI-1: The proposed project or project variants, in combination with cumulative projects, would not alter wind in a manner that would make a cumulatively considerable contribution to a significant cumulative wind impact.	S	**Mitigation Measure M-WI-1**, above, would apply to this cumulative impact	LTSM

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EIR Section 3.G, Shadow			
SH-1: The proposed project or project variants would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces.	LTS	No mitigation measures are required.	N/A
C-SH-1: The proposed project or project variants in combination with cumulative projects in the vicinity would not create new shadow in a manner that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. The proposed project or project variants would not make a cumulatively considerable contribution to a significant cumulative shadow impact.	LTS	No mitigation measures are required.	N/A

Source: SWCA

Table S.2: Summary of Significant Impacts of Proposed Project or Project Variants Identified in the Initial Study

Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Legend: NI = No Impact; LTS = Less than significant or negligible impact, no mitigation required; S = Significant; LTSM = Less than significant with mitigation; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; NA = Not Applicable			
Tribal Cultural Resources (initial study section E.5)			
TCR-1: Construction of the proposed project or project variants could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	S	**Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation and/or Interpretive Program** During ground-disturbing activities that encounter archeological resources, if the Environmental Review Officer (ERO) determines that a significant archeological resource is present, and if in consultation with the affiliated Native American tribal representatives, the ERO determines that the resource constitutes a tribal cultural resource (TCR) and that the resource could be adversely affected by the proposed project, the proposed project shall be redesigned so as to avoid any adverse effect on the significant tribal cultural resource, if feasible. If the ERO, in consultation with the project sponsor team, determines that preservation-in-place of the TCR would be both feasible and effective, then the archeological consultant shall prepare an archeological resource preservation plan (ARPP). Implementation of the approved ARPP by the archeological consultant shall be required when feasible. If the ERO, in consultation with the affiliated Native American tribal representatives and the project sponsor team, determines that preservation-in-place of the TCR is not a sufficient or feasible option, then the project sponsor team shall implement an interpretive program of the TCR in consultation with affiliated Native American tribal representatives. An interpretive plan produced in consultation with affiliated Native American tribal representatives, at a minimum, and approved by the ERO, would be required to guide the interpretive program. The plan shall identify proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, artifacts displays and interpretation, and educational panels or other informational displays.	LTSM

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C-TCR-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative tribal cultural resources impacts.	S	Implement **Mitigation Measure M-TCR-1 Tribal Cultural Resources Preservation and/or Interpretive Program**, above.	LTSM
Geology and Soils (initial study section E.16)			
GE-6: The proposed project or project variants could directly or indirectly destroy a unique paleontological resource or site**.**	S	**Mitigation Measure M-GE-6a: Inadvertent Discovery of Paleontological Resources** Worker Awareness Training - Prior to commencing construction, and ongoing throughout ground disturbing activities (e.g., excavation, utility installation, the project sponsor team and/or their designee shall ensure that all project construction workers are trained on the contents of the Paleontological Resources Alert Sheet, as provided by the Planning Department. The Paleontological Resources Alert Sheet shall be prominently displayed at the construction site during ground disturbing activities for reference regarding potential paleontological resources. In addition, the project sponsor team shall inform the contractor and construction personnel of the immediate stop work procedures and other procedures to be followed if bones or other potential fossils are unearthed at the project site. Should new workers that will be involved in ground disturbing construction activities begin employment after the initial training has occurred, the construction supervisor shall ensure that they receive the worker awareness training as described above. The project sponsor team shall complete the standard form/affidavit confirming the timing of the worker awareness training to the Environmental Review Officer (ERO). The affidavit shall confirm the project's location, the date of training, the location of the informational handout display, and the number of participants. The	LTSM

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		affidavit shall be transmitted to the ERO within five (5) business days of conducting the training. Paleontological Resource Discoveries - In the event of the discovery of an unanticipated paleontological resource during project construction, ground disturbing activities shall temporarily be halted within 25 feet of the find until the discovery is examined by a qualified paleontologist as recommended by the Society of Vertebrate Paleontology standards (SVP 2010) and Best Practices in Mitigation Paleontology (Murphey et al. 2019). Work within the sensitive area shall resume only when deemed appropriate by the qualified paleontologist in consultation with the ERO. The qualified paleontologist shall determine: 1) if the discovery is scientifically significant; 2) the necessity for involving other responsible or resource agencies and stakeholders, if required or determined applicable; and 3) methods for resource recovery. If a paleontological resource assessment results in a determination that the resource is not scientifically important, this conclusion shall be documented in a Paleontological Evaluation Letter to demonstrate compliance with applicable statutory requirements (e.g., Federal Antiquities Act of 1906, CEQA Guidelines Section 15064.5, California Public Resources Code Chapter 17, Section 5097.5, Paleontological Resources Preservation Act 2009). The Paleontological Evaluation Letter shall be submitted to the ERO for review within 30 days of the discovery. If the qualified paleontologist determines that a paleontological resource is of scientific importance, and there are no feasible measures to avoid disturbing this paleontological resource, the qualified paleontologist shall prepare a Paleontological Mitigation Program. The mitigation program shall include measures to fully document and recover the resource of scientific importance. The qualified paleontologist shall submit the mitigation program to the ERO for review and approval within 10 business days of the discovery. Upon approval by the ERO, ground disturbing activities in the project area shall resume and be	

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		monitored as determined by the qualified paleontologist for the duration of such activities. The mitigation program shall include: 1) procedures for construction monitoring at the project site; 2) fossil preparation and identification procedures; 3) curation of paleontological resources of scientific importance into an appropriate repository; and 4) preparation of a Paleontological Resources Report (report or paleontology report) at the conclusion of ground disturbing activities. The report shall include dates of field work, results of monitoring, fossil identifications to the lowest possible taxonomic level, analysis of the fossil collection, a discussion of the scientific significance of the fossil collection, conclusions, locality forms, an itemized list of specimens, and a repository receipt from the curation facility. The project sponsor team shall be responsible for the preparation and implementation of the mitigation program, in addition to any costs necessary to prepare and identify collected fossils, and for any curation fees charged by the paleontological repository. The paleontology report shall be submitted to the ERO for review within 30 business days from conclusion of ground disturbing activities, or as negotiated following consultation with the ERO. **Mitigation Measure M-GE-6b: Preconstruction Paleontological Evaluation and Monitoring Plan during Construction** The project sponsor team shall engage a qualified paleontologist to develop a site-specific monitoring plan prior to commencing soil-disturbing activities at the project site. The Preconstruction Paleontological Monitoring Plan would determine project construction activities requiring paleontological monitoring based on those may affect sediments with moderate sensitivity for paleontological resources. Prior to issuance of any demolition permit, the project sponsor team shall submit the Preconstruction Paleontological Monitoring Plan to the ERO for approval.	

		At a minimum, the plan shall include: 1. Project Description 2. Regulatory Environment – outline applicable federal, state and local regulations 3. Summary of Sensitivity Classification(s) 4. Research Methods, including but not limited to: 4.a. Field studies conducted by the approved paleontologist to check for fossils at the surface and assess the exposed sediments. 4.b. Literature Review to include an examination of geologic maps and a review of relevant geological and paleontological literature to determine the nature of geologic units in the project area. 4.c. Locality Search to include outreach to the University of California Museum of Paleontology in Berkeley. 5. Results: to include a summary of literature review and finding of potential site sensitivity for paleontological resources; and depth of potential resources if known. 6. Recommendations for any additional measures that could be necessary to avoid or reduce any adverse impacts to recorded and/or inadvertently discovered paleontological resources of scientific importance. Such measures could include: 6.a. Avoidance: If a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation. 6.b. Fossil Recovery: If isolated small, medium- or large-sized fossils are discovered during field surveys or construction monitoring, and they are determined to be scientifically significant, they should be recovered. Fossil recovery may involve collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending upon the size and complexity of the fossil discovery. 6.c. Monitoring: Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other types of construction excavations for the presence of fossils, and the fossil recovery and documentation of these fossils before they are destroyed by further ground disturbing actions. Standard	

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		monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (moderate, high, and very high potential); while spot-check monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (moderate or unknown potential). 6.d. Data recovery and reporting: Fossil and associated data discovered during soils disturbing activities should be treated according to professional paleontological standards and documented in a data recovery report. The plan should define the scope of the data recovery report. The consultant shall document the monitoring conducted according to the monitoring plan and any data recovery completed for significant paleontological resource finds discovered, if any. Plans and reports prepared by the consultant shall be considered draft reports subject to revision until final approval by the ERO. The final monitoring report and any data recovery report shall be submitted to the ERO prior to the certificate of occupancy.	

S.3. SUMMARY OF PROJECT ALTERNATIVES

Four alternatives to the proposed project or project variants are evaluated in this EIR:

- the No Project Alternative (Alternative A), as required by CEQA
- the Full Preservation Alternative (Alternative B)
- the Partial Preservation Alternative (Alternative C)
- the Transit Facility Plus Commercial Only Alternative (Alternative D)

These alternatives are summarized below and described in detail in **EIR Chapter 5, Alternatives**.

Table S.3: Comparison of Characteristics of the Proposed Project and EIR Alternatives, pp. S.41-S.45, presents a comparison of the characteristics of the proposed project or project variants to the alternatives. As the impacts of the proposed project are substantially the same as those for each of the four project variants, the alternatives impact analysis does not include a separate comparative analysis for project variants. Three of the project variants—the Emergency Exit Relocation Variant, the Active 17th Street Variant, and the Employee/Family Support Variant—would be feasible variants with any of the alternatives. However, the Joint Development Lobby Relocation Variant would not be a feasible variant with any of the project alternatives because a joint development lobby along Mariposa Street (between York and Hampshire streets) would not be developed for residential uses and therefore would not need to be relocated under Alternatives B and C, which would include residential uses, or Alternative D, which would not include a residential use. **Table S.4: Comparison of Significant Impacts of the Proposed Project and EIR Alternatives**, pp. S.46-S.52, presents a comparison of the potential significant environmental impacts of the proposed project or project variants to those that may result from the alternatives.

ALTERNATIVE A: NO PROJECT ALTERNATIVE

CEQA Guidelines section 15126.6(e) requires that, among the project alternatives, a "no project" alternative be evaluated. CEQA Guidelines section 15126.6(e)(2) requires that the no project alternative analysis "discuss the existing conditions…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and policies and consistent with the available infrastructure and community services."

Alternative A (the No Project Alternative) assumes that the existing site would continue to function as a transit storage and maintenance facility, which would not constitute a change from existing conditions, and that the existing land use controls on the project site would continue to govern site development and would not be changed.

Under Alternative A, the historical architectural resource and air quality impacts associated with excess cancer health risk exposure would not occur and all other potential impacts identified for the proposed project or project variants would not occur.

ALTERNATIVE B: FULL PRESERVATION ALTERNATIVE

Under Alternative B, the existing, approximately 45-foot-tall office wing along Mariposa Street would be retained and the remainder of the maintenance and operations building would be demolished, including the shops wing along Hampshire Street north of the office wing.

Alternative B: Full Preservation Alternative would preserve the portion of the existing maintenance and operations building along Mariposa and Hampshire streets on the southeast portion of site that includes most of the character-defining features of the resource. As part of its adaptation for future transit use, this alternative would also retain and rehabilitate much of the architectural detailing and character-defining features of the property that convey the significance of the historic property. New construction would be reduced by approximately 240,000 gross square feet with reductions to the circulation, storage, maintenance, and operations space in the replacement transit facility. Additionally, the residential development above the transit facility podium would be shifted to the west portion of site, away from the retained historic resource and reduced in size, resulting in 98 fewer units.

Unlike the proposed project or project variants, Alternative B would result in a less-than-significant impact on historic architectural resources. Like the proposed project or project variants, Alternative B would not generate any significant transportation and circulation impacts related to construction but would generate construction-related noise, vibration, and air quality impacts: 1) exposure of sensitive receptors to construction noise in excess of the City's Noise Ordinance, 2) exposure of vibration-sensitive equipment to construction vibration, and 3) toxic air contaminant emissions and excess cancer health risk exposure of sensitive receptors. Thus, construction-related impacts under Alternative B would be substantially the same as under the proposed project or project variants and the same set of construction-related noise and vibration and air quality mitigation measures would apply to Alternative B. Unlike the proposed project or project variants, under Alternative B air quality impacts associated with toxic air contaminant emissions and excess cancer health risk exposure would be reduced to less-than-significant levels with implementation of **Mitigation Measures M-AQ-1** and **M-AQ-3** because Alternative B would have a reduced construction program. Additionally, the construction-related improvement measure for transportation and circulation would also apply to Alternative B.

Development of the new structure on the project site would have substantially similar effects on wind conditions to those resulting from the proposed project or project variants. Therefore, as with the proposed project or project variants, Alternative B would be subject to the same wind mitigation testing program.

With a reduced development program compared to the proposed project or project variants, operational impacts under Alternative B for transportation and circulation, noise, and air quality would be substantially the same (or less than) those under the proposed project or project variants. Thus, the same set of operation-related noise and air quality mitigation measures would apply to Alternative B. Additionally, the operation-related improvement measure for transportation and circulation would also apply to Alternative B.

Significant impacts identified in the initial study for the proposed project or project variants, i.e., tribal cultural resources and paleontological resources, would also occur under Alternative B because excavation would not change. Under Alternative B, these impacts would be reduced to less-than-significant levels with the applicable mitigation measures identified for the proposed project or project variants. No new significant impacts would occur under Alternative B.

ALTERNATIVE C: PARTIAL PRESERVATION ALTERNATIVE

Alternative C: Partial Preservation Alternative would preserve, retain, and rehabilitate the historic property similar to Alternative B, but not to the level that it would continue to be able to convey the significance of the historic property. Although new construction would be reduced by a similar amount as Alternative B (reduction of approximately 230,000 gross square feet) and space reductions would be imposed on the same set of transit facility functions (storage, circulation, maintenance, and operations), the massing of the replacement transit facility would not be set back from the retained office wing as effectively as under Alternative B, i.e., with larger notches at the west and north edges of the office wing and deeper setbacks above the office wing. Furthermore, the residential development above the transit facility podium would be more similar to the proposed project or project variants than Alternative B with respect to the setbacks and massing of the residential floors above the transit facility podium.

Although Alternative C would reduce the significant impact to the historic property, it would not reduce it to a less-than-significant level. Therefore, as with the proposed project or project variants, Alternative C would result in a significant impact on historic architectural resources, and mitigation would be imposed. As with the proposed project or project variants, the identified mitigation would not reduce the impact to a less-than-significant level; thus, it would remain significant and unavoidable even with mitigation under Alternative C.

Like the proposed project or project variants, Alternative C would not generate any significant transportation and circulation impacts related to construction but would generate construction-related noise, vibration, and air quality impacts: 1) exposure of sensitive receptors to construction noise in excess of the City's Noise Ordinance, 2) exposure of vibration-sensitive equipment to construction vibration, and 3) toxic air contaminant emissions and excess cancer health risk exposure of sensitive receptors. Thus, construction-related impacts under Alternative C would be substantially the same as under the proposed project or project variants and the same set of

construction-related noise and vibration and air quality mitigation measures would apply Alternative C. Unlike the proposed project or project variants, under Alternative C air quality impacts associated with toxic air contaminant emissions and excess cancer health risk exposure would be reduced to less-than-significant levels with implementation of **Mitigation Measures M-AQ-1** and **M-AQ-3** because Alternative C would have a reduced construction program. Additionally, the construction-related improvement measure for transportation and circulation would also apply to Alternative C.

Development of the new structure on the project site would have substantially similar effects on wind conditions as the proposed project or project variants. Therefore, as with the proposed project or project variants, Alternative C would be subject to the same wind mitigation testing program.

With a reduced development program compared to the proposed project or project variants, operational impacts under Alternative C for transportation and circulation, noise, and air quality would be substantially the same as (or less than) those under the proposed project or project variants. Thus, the same set of operation-related noise and air quality mitigation measures would apply to Alternative C. Additionally, the operation-related improvement measure for transportation and circulation would also apply to Alternative C.

Significant impacts identified in the initial study for the proposed project or project variants, i.e., tribal cultural resources and paleontological resources, would also occur under Alternative C because excavation would not change. Under Alternative C, these impacts would be reduced to less-than-significant levels with the applicable mitigation measures identified for the proposed project or project variants. No new significant impacts would occur under Alternative C.

ALTERNATIVE D: TRANSIT FACILITY PLUS COMMERCIAL ONLY ALTERNATIVE

Alternative D: Transit Facility Plus Commercial Only Alternative would demolish the existing maintenance and operations building as under the proposed project or project variants. Unlike the proposed project or project variants, the residential component of the joint development would not be part of the Alternative D land use program. Thus, new construction would be reduced by approximately 540,000 gross square feet, and the replacement transit facility would be developed similar to the transit facility under the proposed project or project variants with ground-floor commercial uses. Due to the removal of residential development above the replacement transit facility, the maximum height of the Alternative D would be 75 feet, exclusive of rooftop mechanical space.

This EIR presents Alternative D as a reduced density alternative that addresses the significant and unavoidable air quality impacts of the proposed project or project variants. In addition, Alternative D provides an understanding of the environmental impacts of redeveloping the site with

a new transit facility that would also include commercial uses for City-decisionmakers and the public. Alternative D would not reduce the significant and unavoidable impact to the historic architectural resource. Therefore, as with the proposed project or project variants, Alternative D would result in a significant impact on historic architectural resources, and mitigation would be imposed. As with the proposed project or project variants, mitigation would not reduce the impact to a less-than-significant level; thus, the significant impact on historic architectural resources would remain significant and unavoidable even with mitigation under Alternative D.

Like the proposed project or project variants, Alternative D would not generate any significant transportation and circulation impacts related to construction but would generate construction-related noise, vibration, and air quality impacts: 1) exposure of sensitive receptors to construction noise in excess of the City's Noise Ordinance, 2) exposure of vibration-sensitive equipment to construction vibration, and 3) toxic air contaminant emissions and excess cancer health risk exposure of sensitive receptors. Thus, construction-related impacts under Alternative D would be substantially the same as (or less than) under the proposed project or project variants. For example, the change in scope to the construction program -- to build a smaller structure in less time -- would result in reductions to the construction-related noise and air quality impacts under the proposed project or project variants). Nonetheless, the same set of construction-related noise and vibration and air quality mitigation measures would apply to Alternative D. Unlike the proposed project or project variants, under Alternative D air quality impacts associated with toxic air contaminant emissions and excess cancer health risk exposure would be less than those of the proposed project or project variants and would be reduced to less-than-significant levels with mitigation. Additionally, the construction-related improvement measure for transportation and circulation would also apply to Alternative D.

Additionally, development of the new structure on the project site would have substantially similar effects on wind conditions as the proposed project or project variants. Therefore, as with the proposed project or project variants, Alternative D would be subject to the same wind mitigation testing program.

With a reduced development program compared to the proposed project or project variants, operational impacts under Alternative D for transportation and circulation, noise, and air quality would be substantially the same as (or less than) those under the proposed project or project variants. Thus, the same set of operation-related noise and air quality mitigation measures would apply to Alternative D. Additionally, the operation-related improvement measure for transportation and circulation would also apply to Alternative D.

Significant impacts identified in the initial study for the proposed project or project variants, i.e., tribal cultural resources and paleontological resources, would also occur under Alternative D because excavation would not change. Under Alternative D, these impacts would be reduced to less-than-significant levels with the applicable mitigation measures identified for the proposed

project or project variants. No new significant impacts would occur under Alternative D than are identified for the proposed project or project variants.

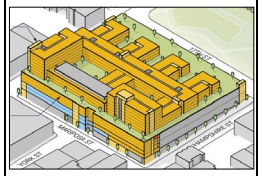
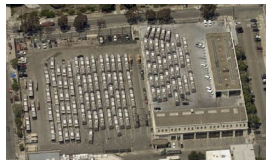
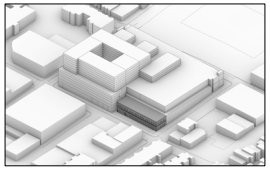
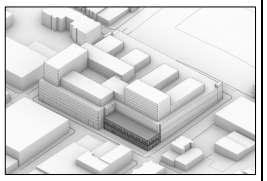
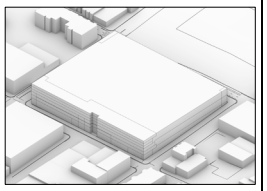
ENVIRONMENTALLY SUPERIOR ALTERNATIVE

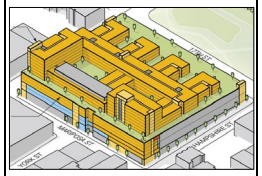
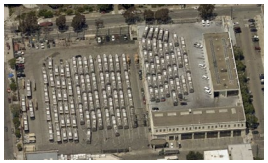
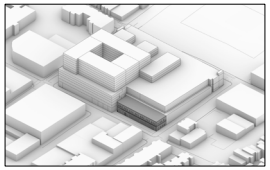
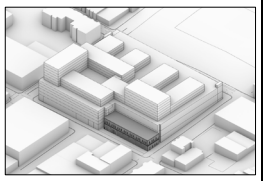
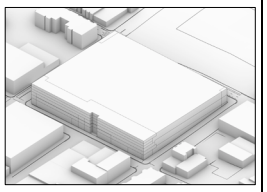
Pursuant to CEQA Guidelines section 15126.6(e)(2), if the no project alternative is the environmentally superior alternative, then an EIR is required to identify another environmentally superior alternative from among the alternatives evaluated. The environmentally superior alternative is the alternative that best avoids or lessens any significant effects of the proposed project or project variants, even if the alternative would impede to some degree the attainment of the project objectives. The proposed project or project variants would have a significant impact related to historical architectural resources that cannot be mitigated to a less-than-significant level. Alternative A: No Project Alternative is considered the overall environmentally superior alternative because it would not result in the significant impacts associated with implementation of the proposed project or project variants. Alternative A, however, would not meet any of the basic project objectives. Alternative A, Alternative B, Alternative C, and Alternative D would avoid or substantially lessen the significant and unavoidable project and cumulative air quality impacts associated with the project-related exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure. Alternative A would avoid these impacts because it would not redevelop the site. Alternatives B, C, and D would lessen the air quality impacts, primarily through the reduced construction program, and with implementation of the identified air quality mitigation measures would reduce excess cancer health risk exposure to less-than-significant levels. However, Alternative D would not avoid or substantially lessen the significant and unavoidable historic architectural resource impact.

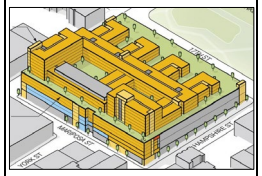
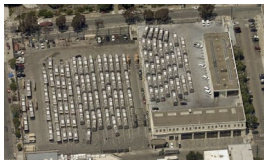
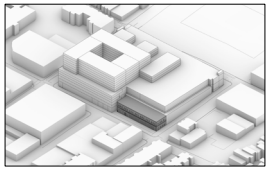
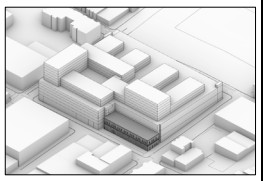
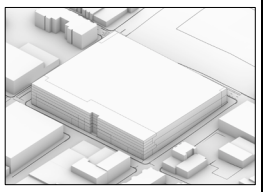
Thus, Alternative B: Full Preservation Alternative would be the environmentally superior alternative because it would have the fewest significant environmental impacts from among the alternatives evaluated. Alternative B would retain and rehabilitate the existing office wing of the maintenance and operations building and develop the new structure with appropriate setbacks from the office wing. Additionally, the massing of new construction above the replacement transit facility would be shifted to the west portion of the site. As a result, it would avoid the significant adverse impact on the historical resource. Significant construction- and operation-related tribal cultural resources, noise and vibration, wind, and paleontological resources impacts would be similar to those resulting from the proposed project or project variants and other alternatives and would be mitigated to less-than-significant levels. The significant air quality impacts associated with exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure would also be mitigated to less-than-significant levels.

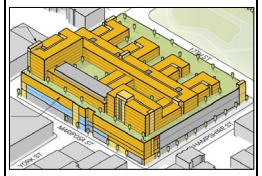
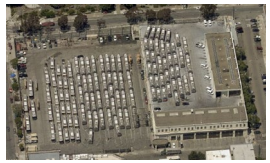
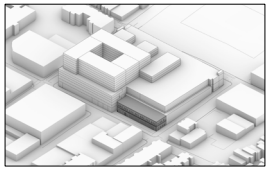
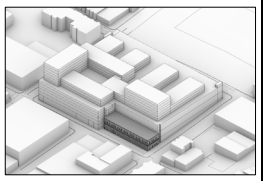
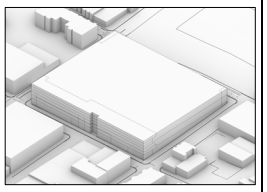
In addition, Alternative B would not result in any new significant impacts or substantially more severe impacts as compared to the proposed project or project variants.

Table S.3: Comparison of Characteristics of the Proposed Project and EIR Alternatives

	Proposed Project [NOTE A]	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative** [NOTE B]	**Alternative C: Partial Preservation Alternative** [NOTE B]	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Characteristics of the Proposed Project and Project Alternatives					
Transit Facility Podium Height (feet)	75	10.5 – 44	75	75	75
Number of Transit Facility Stories	3	2	3	3	3
High-Rise Tower Height (feet)	Up to 150	–	Up to 150	Up to 150	–
Number of Joint Development Stories	Up to 13	–	Up to 13	Up to 13	–
Excavation Depth	35 feet; 248,900 cubic yards	–	35 feet; 248,900 cubic yards	35 feet; 248,900 cubic yards	35 feet; 248,900 cubic yards
Construction Duration	3 – 4 years	–	3 – 4 years	3 – 4 years	2.5 – 3 years
Building and Site Characteristics	**1,300,000 gsf**	**221,450 gsf**	**1,060,000 gsf**	**1,070,000 gsf**	**756,000 gsf**
Paved Bus Storage Yard	–	112,450 gsf	–	–	
Enclosed Bus Facility	723,000 gsf	109,000 gsf	578,000 gsf	597,000 gsf	723,000 gsf
Ramps & Circulation, Bus Storage and Service	*671,000 gsf*	–	*532,000 gsf*	*551,000 gsf*	*671,000 gsf*
Administration and Common Area	*52,000 gsf*	–	*46,000 gsf*	*46,000 gsf*	*52,000 gsf*
Residential	544,000 gsf	–	449,000 gsf	440,000 gsf	–
Commercial	33,000 gsf	–	33,000 gsf	33,000 gsf	33,000 gsf

	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Residential Units	**575**	–	**477**	**459**	–
Studio	141	–	114	110	–
One-Bedroom	206	–	172	165	–
Two- to Three-Bedroom	228	–	191	184	–
Open Space	**91,000 sq. ft.**		**81,000 sq. ft.**	**84,000 sq. ft.**	**91,000 sq. ft.**
Transportation and Circulation Features of the Proposed Project and Project Alternatives					
Maintenances Repair Bays	**18**	**24**	**16**	**16**	**18**
Vehicle Parking Spaces [NOTE C]	**310**	**214**	**270**	**283**	**310**
Trolley Coaches (40 foot/60 foot)	213 (63/150)	158 (65/93)	194 (74/120)	207 (43/164)	213 (63/150)
Non-Revenue Vehicles (large/standard)	97 (8/89)	56	76 (3/73)	76 (3/73)	97 (8/89)
SFMTA Staff	0	0	0	0	0
Residential	0	–	0	0	–
Loading Supply	**160 curb feet (3/2)**	**0 curb feet (0/1)**	**100 curb feet (2/2)**	**100 curb feet (2/2)**	**40 curb feet (1/2)**
Commercial (On-Street/Off-Street)	40 curb feet (1/2)	0 curb feet (0/1)	40 curb feet (1/2)	40 curb feet (1/2)	40 curb feet (1/2)
Passenger (On-Street/Off-Street)	120 curb feet (2/0)	None	60 curb feet (1/0)	60 curb feet (1/0)	–
On-Street Parking Spaces Removed Along Adjacent Streets	**48**	–	**24**	**24**	**19**

	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Bicycle Parking Spaces	**773**	**5**	**295**	**291**	**69**
Class 1	736 [NOTE D]	0	252	249	60
Class 2	37	5	43	42	9
Streetscape Changes					
Curb Cuts [NOTE E]					
17th Street between Bryant and Hampshire streets	1 (42 feet)	1 (52 feet)	1 (42 feet)	1 (42 feet)	1 (42 feet)
Mariposa Street between Bryant and Hampshire streets	4 (20 feet, 97 feet, 63 feet, 47 feet)	4 (30 feet, 50 feet, 13 feet, 146 feet)	3 (20 feet, 97 feet, 222 feet)	3 (20 feet, 97 feet, 222 feet)	4 (20 feet, 97 feet, 63 feet, 47 feet)
Sidewalk Extensions					
Bryant Street north of Mariposa Street	Yes	No	Yes	Yes	Yes
Mariposa Street east of Bryant Street	Yes	No	Yes	Yes	Yes
Hampshire Street north of Mariposa Street	Yes	No	No	No	Yes
Sidewalk Improvements					
Mariposa Street widening	12-foot width	7-foot width	12-foot width	12-foot width	12-foot width
Street tree retention and replacement	Yes	No	Yes	Yes	Yes

	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Intersection Improvements					
Raided crosswalk with rapid flash beacon at crossing of 17th Street at Hampshire Street	Yes	No	Yes	Yes	Yes
Curb ramps for pedestrian crossings adjacent to the project site and a curb ramp on the southeastern side of the Mariposa/York street intersection facing Mariposa Street	Yes	No	Yes	Yes	Yes
Continental-style crosswalks at all approaches at the intersections of Hampshire/17th streets, Hampshire/Mariposa streets, Mariposa/York streets	Yes	No	Yes	Yes	Yes
Bicycle Lanes					
17th Street between Bryant and Hampshire streets	Protected, widened, painted green	No	Protected, widened, painted green	Protected, widened, painted green	Protected, widened, painted green
Bus Stops					
Northwest and southeast corners of Mariposa and Bryant streets	New shelters, transit notification systems, and lighting	No	New shelters, transit notification systems, and lighting	New shelters, transit notification systems, and lighting	New shelters, transit notification systems, and lighting

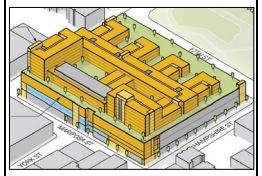
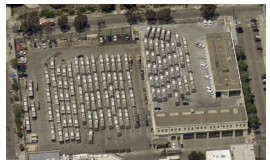
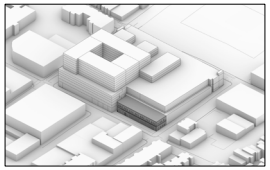
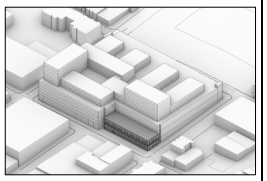
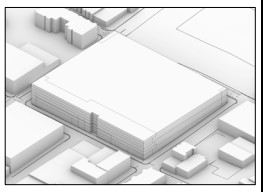
	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Transportation Demand Management Measures [NOTE F]	Yes	–	Yes	Yes	Yes
Sustainability Features					
LEED Certification Goal	LEED Gold	–	LEED Gold	LEED Gold	LEED Gold
Utility Infrastructure					
Connect to existing water, AWSS, sewer, and electrical infrastructure systems (Bryant, 17th, Hampshire and Mariposa streets)	Yes	–	Yes	Yes	Yes

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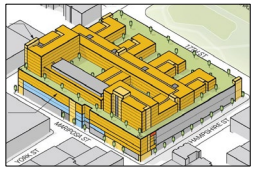
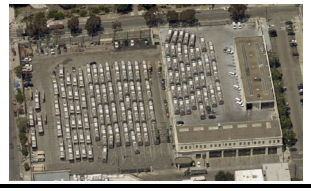
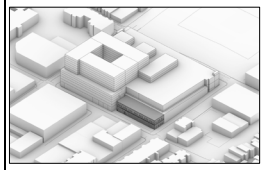
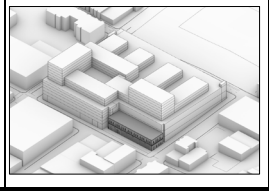
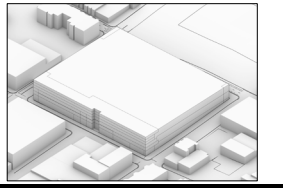
Table S.4: Comparison of Significant Impacts of the Proposed Project and EIR Alternatives

	Proposed Project	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative**	**Alternative C: Partial Preservation Alternative**	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Cultural Resources Impacts (EIR Section 3.B)					
Onsite Historical Architectural Resource					
CR-1: The proposed project or project variants would cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5 of the CEQA Guidelines.	SUM	No Impact (NI)	Less than the proposed project or project variants (LTS)	Similar to but reduced from those of the proposed project or project variants (SUM)	Similar to the proposed project or project variants (SUM)
Tribal Cultural Resources (Initial Study Topic E.5)					
Change in Significance					
TCR-1: Construction of the proposed project or project variants could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

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	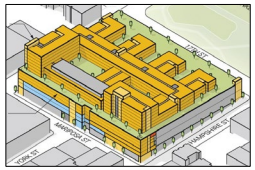	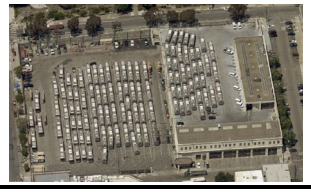	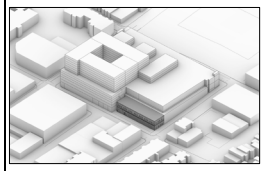	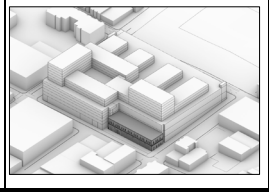	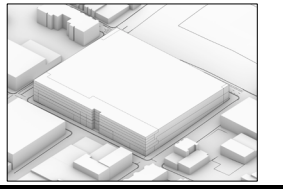
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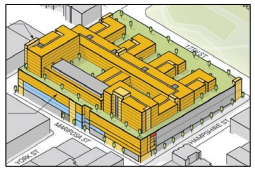
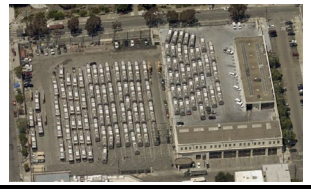
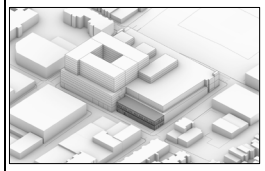
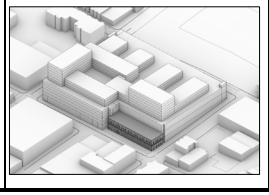
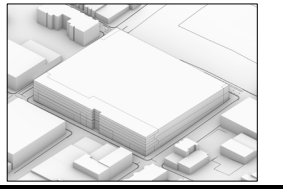
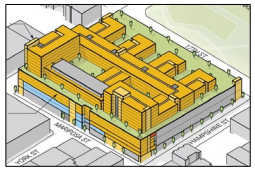
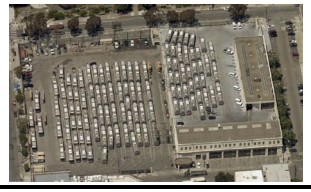
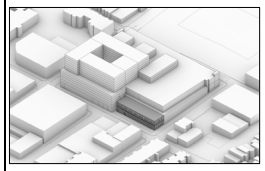
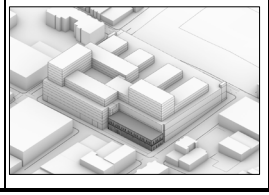
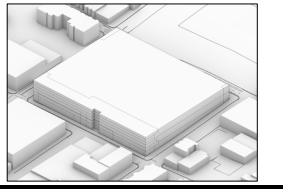
Cumulative Tribal Cultural Resources					
C-TCR-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative tribal cultural resources impacts.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Noise and Vibration Impacts (EIR Section 3.D)					
Construction Noise					
NO-1: Construction of the proposed project or project variants would generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the San Francisco Noise Ordinance or applicable standards of other agencies.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Construction Vibration					
NO-2: Construction of the proposed project or project variants would generate excessive groundborne vibration or groundborne noise levels.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Operational Noise					
NO-3: Operation of the proposed project or project variants would generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan, or applicable standards of other agencies.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Cumulative Construction Noise					
C-NO-1: Construction noise as a result of the proposed project or project variants, combined with	LTSM	No Impact (NI)	Similar to the proposed project or	Similar to the proposed project or	Similar to the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
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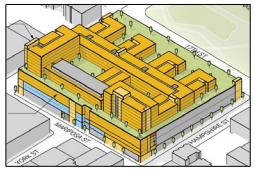
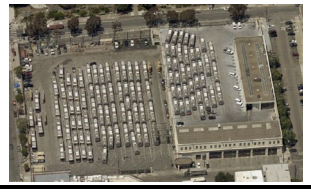
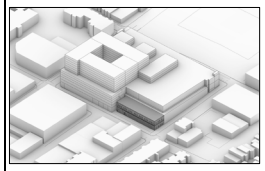
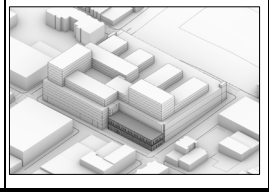
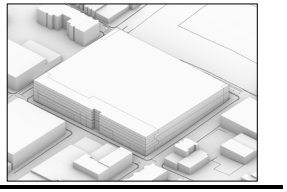
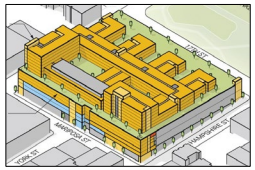
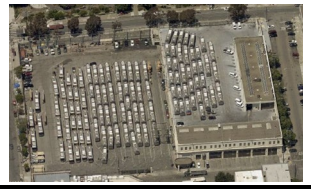
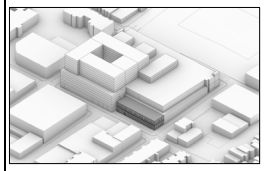
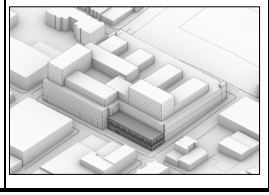
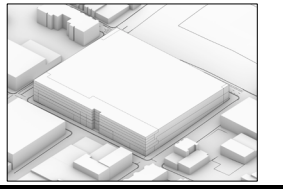
construction noise from cumulative projects in the vicinity, would cause a substantial temporary increase in ambient noise levels.			project variants (LTSM)	project variants (LTSM)	
Air Quality Impacts (EIR Section 3.E)					
Fugitive Dust and Criteria Air Pollutants (Construction)					
AQ-1: During construction, the proposed project or project variants would not generate significant fugitive dust emissions, but would generate criteria air pollutant emissions at levels which would result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.	LTSM	No Impact (NI)	Similar to but less than the proposed project or project variants (LTSM)	Similar to but less than the proposed project or project variants (LTSM)	Less than the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Toxic Air Contaminants (Construction and Operation)					
AQ-3: Construction and operation of the proposed project or project variants would generate toxic air contaminants, including DPM, at levels which would expose sensitive receptors to substantial pollutant concentrations.	SUM	No Impact (NI)	Similar to but less than the proposed project or project variants (LTSM)	Similar to but less than the proposed project or project variants (LTSM)	Less than the proposed project or project variants (LTSM)
Cumulative Air Quality					
C-AQ-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would contribute considerably to cumulative health risk impacts on sensitive receptors.	SUM	No Impact (NI)	Similar to but less than the proposed project or project variants (LTSM)	Similar to but less than the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
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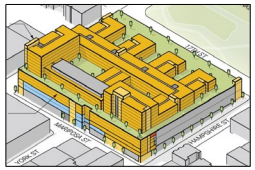
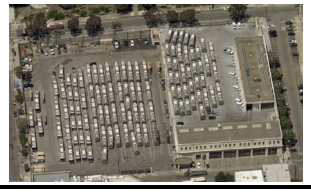
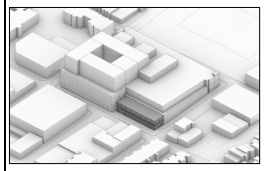
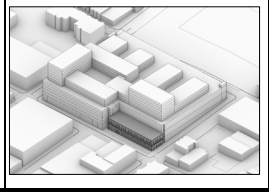
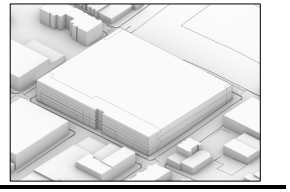
Wind Impacts (EIR Section 3.F)					
Wind in Outdoor Public Areas					
WI-1: The proposed project or project variants would create wind hazards in publicly accessible areas of substantial pedestrian use in the vicinity of the project site.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Cumulative Wind					
C-WI-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would alter wind in a manner that would make a cumulatively considerable contribution to a significant cumulative wind impact.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
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Geology and Soils Impacts (Initial Study Topic E.16)					
Paleontological Resources					
GE-6: The proposed project or project variants could directly or indirectly destroy a unique paleontological resource or site**.**	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

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S.4. AREAS OF KNOWN CONTROVERSY AND ISSUES TO BE RESOLVED

The planning department received an Environmental Evaluation Application for the proposed project on November 20, 2019. The filing of the application initiated the environmental review process. In accordance with CEQA Guidelines sections 15063 and 15082, the planning department published a NOP of an EIR and Notice of Public Scoping Meeting (**EIR Appendix A**) on August 19, 2020, announcing its intent to prepare and distribute a focused EIR and beginning the formal CEQA scoping process. The 30-day NOP public scoping period began on August 19, 2020 and ended on September 18, 2020. Pursuant to CEQA Guidelines section 15083, the planning department held a public scoping meeting on Tuesday, September 2, 2020, between 6 p.m. and 8 p.m.

The purpose of the 30-day NOP public scoping period (or scoping process) is to allow the public and government agencies to comment on the issues and provide input on the scope of the EIR. Individuals and agencies who received the notice include local, regional, and state agencies; property owners and adjacent residents and tenants within 300 feet of the project site; and other potentially interested parties who requested such notice, including neighborhood organizations. During the NOP public scoping period, a total of eight comments were provided: one speaker provided oral comments[2] at the scoping meeting and seven comment letters and emails were submitted to the planning department. The planning department prepared an initial study (see **EIR Appendix B**) that includes a discussion and analysis of the potential environmental impacts of the proposed project or project variants with respect to all of the topics included in Appendix G of the CEQA Guidelines, as modified by the planning department. The initial study also identifies the topics to be addressed in the EIR.

EIR Chapter 1, Introduction, pp. 1.3-1.5, provides summaries of the comments received during the NOP scoping period. The summaries note where the issues are specifically addressed in the EIR or the initial study (**EIR Appendix B**). On the basis of public comments received, known areas of controversy and issues to be resolved are summarized in **EIR Chapter 4, Other CEQA Considerations,** under "Areas of Known Controversy and Issues to be Resolved", pp. 4.8-4.9, as follows:

- Rehabilitation of the existing site as an alternative
- Reevaluation of the need for the project given 2020 changes in housing and transit demand due to the COVID-19 response
- Preservation of the existing onsite historical architecture
- Impacts to bicyclists, including accident rate changes

[2] This commenter provided two discrete sets of comments during the public scoping meeting.

- Noise impacts on residents
- Impacts to industrial uses in the Mission District neighborhood
- Impacts related to affordable housing in the project vicinity and rent increases
- Impacts on neighborhood characteristics such as the existing architectural character that includes small manufacturing, live-work lofts, and historic buildings
- Parking for Muni workers in the project vicinity and impacts on Muni workers as well as businesses and residents in the vicinity
- Wind and shadow impacts on residents
- Impacts on Franklin Square due to the increased number of local residents and employees
- Impacts on birds, including nesting birds
- Artificial lighting impacts on wildlife

Environmental concerns raised in public comment letters were taken into consideration in the EIR and initial study impact analyses (see **EIR Appendix B** for the initial study).

1. INTRODUCTION

EIR Chapter 1, Introduction, presents a summary of the Potrero Yard Modernization Project at 2500 Mariposa Street, outlines the purpose of this Environmental Impact Report (EIR), summarizes the environmental review process, and describes the organization of the EIR.

A. PROJECT SUMMARY

The project sponsor, the San Francisco Municipal Transportation Agency (SFMTA), proposes to replace the Potrero Trolley Coach Division Facility at 2500 Mariposa Street (Potrero Yard), in the northeast portion of San Francisco's Mission District near the South of Market and Potrero Hill neighborhoods. The proposed project would accommodate the expansion of the SFMTA's transit vehicle fleet in a new replacement structure with space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses. The new, approximately 1,300,000-gross-square-foot structure would occupy the 4.4-acre site and rise to heights ranging from 75 to 150 feet across the site. It would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the project as part of a joint development program between the SFMTA (project sponsor and property owner) and a private project co-sponsor (developer). Together the SFMTA and the private project co-sponsor are referred to as the project sponsor team. The joint development program would include a ground-floor commercial use and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit facility. The majority of residential development would be atop the replacement transit facility on floors 7 through 13. **EIR Chapter 2, Project Description**, presents further details about the proposed project and four project variants.

B. ENVIRONMENTAL REVIEW PROCESS

Purpose of this Environmental Impact Report

This EIR has been prepared by the San Francisco Planning Department (planning department) in the City and County of San Francisco, the Lead Agency for the project, in compliance with the provisions of the California Environmental Quality Act (CEQA) (California Public Resources Code section 21000 et seq.), the CEQA Guidelines (California Code of Regulations Title 14, section 15000 et seq.), and Chapter 31 of the San Francisco Administrative Code. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project.

Pursuant to CEQA Guidelines section 15161, this is a project-level EIR (an EIR that examines the physical environmental impacts of a specific development project). As determined and guided by findings of the initial study for the proposed project or project variants (see **EIR Appendix B**), this

EIR evaluates the potential for the proposed project or project variants[1] to cause significant impacts under a limited number of environmental topics: cultural resources (historic architectural resources), transportation and circulation, noise and vibration, air quality, wind, and shadow. The initial study determined that the remaining environmental topics would have less-than-significant impacts with mitigation, less-than-significant impacts, no impacts, or would not be applicable, and therefore, they were not carried forward for analysis in this EIR. As defined in CEQA Guidelines section 15382, a "significant effect on the environment" is:

> . . . a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

This EIR assesses potentially significant impacts of the proposed project and project variants. As stated in CEQA Guidelines section 15121(a), an EIR is an informational document intended to inform public agency decision-makers and the public of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. CEQA requires that public agencies not approve projects until all feasible means available have been employed to substantially lessen the significant environmental effects of such projects.

Before any discretionary project approvals may be granted for the proposed project or project variants, the San Francisco Planning Commission (planning commission) must certify the EIR as adequate, accurate, and objective. EIR adequacy is defined in CEQA Guidelines section 15151, Standards for Adequacy of an EIR, which states:

> An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

The degree of specificity required in an EIR should "correspond to the degree of specificity involved in the underlying activity which is described in the EIR" (CEQA Guidelines section 15146).

[1] The proposed project includes four variants that consider modifications to limited features or aspects of the project. They are described in **EIR Chapter 2, Project Description**, pp. 2.56-2.58.

City decision-makers will use the certified EIR, along with other information and public processes, to determine whether to approve, modify, or disapprove the proposed project or project variants, and to require any feasible mitigation measures as conditions of project approval.

C. STEPS IN THE EIR PROCESS

CEQA Guidelines sections 15080 to 15097 set forth the EIR process, which includes multiple phases involving notification and input from responsible agencies and the public. The main steps in this process are described below.

Notice of Preparation of an Environmental Impact Report

On November 20, 2019, the project sponsor submitted an Environmental Evaluation Application for the Potrero Yard Modernization Project to the planning department.[2] This filing initiated the environmental review process. The EIR process includes an opportunity for the public to review and comment on the proposed project's potential environmental effects and to further inform the environmental analysis.

On August 19, 2020, the planning department published a Notice of Preparation (NOP) of an Environmental Impact Report and Notice of Public Scoping Meeting (**EIR Appendix A, Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting, August 19, 2020**), announcing its intent to solicit public comments on the scope of the environmental analysis and to prepare and distribute an EIR on the Potrero Yard Modernization Project. The planning department mailed the Notice of Availability of an NOP and Notice of Public Scoping Meeting to the State Clearinghouse and relevant state and regional agencies; occupants of adjacent properties; property owners and occupants within 300 feet of the project site; and other potentially interested parties, including neighborhood organizations and others that have requested such notice. A legal notice in the newspaper was also published on Wednesday, August 19, 2020.

Public Review of and Comments on the Notice of Preparation

Publication of the NOP initiated a 30-day public review and comment period that ended on September 18, 2020. Pursuant to the California Public Resources Code section 21083.9 and CEQA Guidelines section 15206, the planning department held a public scoping meeting on September 2, 2020, to receive input on the scope of the environmental review for this project.[3] During the NOP

[2] San Francisco Municipal Transportation Authority, Environmental Evaluation Application for the Potrero Yard Modernization Project, November 20, 2019. This document and all other documents cited herein, unless otherwise noted, will be made available by request for review by emailing CPC.PotreroYardEIR@sfgov.org or calling 628-652-7563.

[3] The public scoping meeting was held using an online platform on Tuesday, September 2, 2020, between 6 p.m. and 8 p.m. A transcript of the proceedings and written comments are available as part of Case No. 2019-021884ENV.

public scoping period, a total of eight comments were provided: one speaker provided oral comments[4] at the scoping meeting and seven comment letters and emails were submitted to the planning department. The comments received in response to the NOP and a copy of the transcript from the public scoping meeting are available for review as part of Case File No. 2019-021884ENV. The planning department has considered the comments made by the public in preparation of the Draft EIR for the proposed project and project variants. Comments on the NOP that relate to environmental issues are summarized below and are addressed in this EIR.

The topics raised in the written and oral comments include, but are not limited to, the environmental topics listed in **Table 1.1: Summary of Scoping Comments**, which also summarizes the main issues raised in the comments.

Table 1.1: Summary of Scoping Comments

EIR or Initial Study (IS) Section	Main Issues Raised
EIR Chapter 2 Project Description	• A reassessment of the housing market and transit demand given economic and transportation changes during the COVID-19 pandemic • The context of the proposed project within SFMTA's greater building programs • Updates on SFMTA's budgets and facility planning • SFMTA's financial ability to deliver the project
EIR Section 3.C Transportation and Circulation	• The effects of no parking provided onsite and Muni workers parking in the neighborhood. • The effects of an increase in the number of Muni workers included in the proposed project, with the removal of on-street and off-street parking, on small businesses and residents in the neighborhood • Parking impacts on the neighborhood due to the increase in Muni workers with very early morning start times who would likely drive but do not have parking onsite • Parking impacts on Muni workers due to the removal of onsite parking and the increased demand from more onsite Muni workers and new onsite residents with no dedicated parking • Upgrades to transportation infrastructure included to accommodate new residents, workers, and pedestrians/visitors in the project area • The expected increase in pedestrian traffic, besides that from Muni workers and new residents, and how an increase in pedestrian traffic will impact adjacent properties • Project effects on cyclists and the expected increase in bicycle-related traffic accidents
EIR Section 3.D Noise and Vibration	• Noise impacts on residents in the immediate vicinity, including at 475 Hampshire Street • Findings required under Administrative Code Chapter 29
EIR Section 3.F Wind	• Wind impacts on residents in the immediate vicinity

[4] This commenter provided two discrete sets of comments during the public scoping meeting.

EIR or Initial Study (IS) Section	Main Issues Raised
EIR Section 3.G Shadow	• Shadow impacts on residents in the immediate vicinity, including residents at 475 Hampshire Street
EIR Chapter 5 Alternatives	• Details about SFMTA's process in identifying and proposing facility replacement and not electing for facility rehabilitation
Initial Study Section E.1 Land Use and Planning	• Project impacts on the artist culture and community that lives and works in the Mission District (e.g., gentrification) and how identified impacts will be mitigated to preserve the artistic culture of the area
Initial Study Section E.3 Population and Housing	• Project impacts on neighborhood characteristics, such as live-work lofts, artist studios, and small manufacturing businesses • Project impacts on the neighborhood related to gentrification, rent increases, further forced relocation, and the artist culture in the neighborhood, and how identified impacts will be mitigated • Project impacts on the Muni workforce and specifically the younger generation who may live far away and cannot afford to live nearby
Initial Study Section E.4 Cultural Resources/Historic Architectural Resources	• Effects on the historical features of the existing building • Effects on the existing architectural character of the neighborhood (such as artist lofts, small manufacturing businesses, and historical buildings)
Initial Study Section E.5 Tribal Cultural Resources	• Requirements of Assembly Bill 52 and Senate Bill 18, and Native American Heritage Commission recommendations for cultural resources research, surveys, and reporting
Initial Study Section E.12| Recreation	• Impacts on Franklin Square • Measures to be taken to accommodate increased park use by new residents and Muni workers
Initial Study Section E.15 Biological Resources	• Artificial lighting and its impacts on biological resources • Exterior window glass and concerns about bird collisions • The potential for nesting birds and the need for nesting bird surveys, nesting bird buffers, and bird monitoring

The topics raised in the NOP comment letters and at the public scoping meeting are summarized in the table above and, to the extent these are related to potential physical environmental impacts of the project, have been addressed in the Draft EIR with initial study. Comments expressing support for, or opposition to, the proposed project (including components of the proposed project) or project variants will be considered independently of the environmental review process by City decision-makers as part of their decision to approve, modify, or disapprove the proposed project or project variants.

Draft Environmental Impact Report

This Draft EIR, including the initial study (**EIR Appendix B, Initial Study – Potrero Yard Modernization Project (including Water Supply Assessment), June 30, 2021**), has been prepared in accordance with CEQA and the CEQA Guidelines. It provides an analysis of the project-specific physical environmental impacts of construction and operation of the proposed

project and project variants, and the proposed project's or project variant's contribution to the environmental impacts from cumulative projects in the vicinity, the City as a whole, or larger geographic areas, as applicable.

The Draft EIR is available for viewing or downloading at the planning department website, *sfplanning.org/sfceqadocs*, by selecting Environmental Impact Reports and Negative Declarations under "Select a Review Category" or by searching for Case File No. 2019-021884ENV or Potrero Yard Modernization Project under "Search Title Name and Address". Due to the COVID-19 pandemic, no in-person document viewing at the planning department office is available at the date of publication. You may request that a copy be sent to you by calling 628-652-7563 or emailing the EIR Coordinator at *CPC.PotreroYardEIR@sfgov.org*. In addition, all documents referenced in this Draft EIR, including the initial study, are available upon request using the same contact information above.

HOW TO COMMENT ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

This Draft EIR, including the initial study, was published on June 30, 2021. There will be a public hearing before the planning commission during the approximately 62-day public review and comment period for this EIR to solicit public comment on the adequacy and accuracy of information presented in this Draft EIR. The public comment period for this EIR is July 1, 2021 to August 31, 2021. The public hearing on this Draft EIR has been scheduled before the planning commission for August 26, 2021.

Please be advised that due to the COVID-19 emergency, the planning commission may conduct this hearing remotely using videoconferencing technology or in-person at City Hall. Additional information may be found on the planning department's website. Please check *https://sfplanning.org/hearings-cpc* the week of the hearing for the hearing agenda, location and/or public access code, or contact the assigned planner. The hearing will be streamed online at SFGovTV, *https://sfgovtv.org/planning*, or on cable channels 26 or 78, subject to SFGovTV scheduling. Please note, if the hearing is held remotely, only members of the planning commission and department staff will have access to the video conferencing session, and members of the public can watch the hearing from the sources listed above. If the hearing is held remotely, members of the public may make live public comment during the hearing item by phone, using the phone number (415) 655-0001 and entering a Public Comment Access Code that changes weekly for each hearing. The Public Comment Access Code along with information on how to provide public comment at the hearing will be made available on *https://sfplanning.org/hearings-cpc* for the specified hearing date. Further information and instructions on accessing the planning commission hearing and making a public comment are detailed on the planning department's website, *https://sfplanning.org/hearings-cpc*. Written comments from members of the public may be submitted to *CPC.PotreroYardEIR@sfgov.org*.

A hearing has also been scheduled on August 4, 2021 before the San Francisco Historic Preservation Commission (historic preservation commission) in order for the historic preservation commissioners to provide comments to the planning commission on the Draft EIR, including the initial study. Please be advised that due to the COVID-19 emergency, the Historic Preservation Commission may conduct this hearing remotely using videoconferencing technology or in-person at City Hall. Additional information may be found on the planning department's website. Please check *https://sfplanning.org/hearings-hpc* the week of the hearing for the hearing agenda, location and/or public access code or contact the assigned planner. If the hearing is held remotely, only members of the historic preservation commission and department staff will have direct access to the video conference software. If the hearing is held remotely, members of the public may make live public comment during the hearing item by phone, using the phone number (415) 655-0001 and entering a Public Comment Access Code that changes weekly for each historic preservation commission hearing. The Public Comment Access Code will be made available with additional instruction on how to comment at the hearing. Please check *https://sfplanning.org/hearings-hpc* for the specified hearing date, or contact the assigned planner for this information. The public can watch this hearing online at SFGovTV, *https://sfgovtv.org/planning*, on cable channels that will be specified in the hearing agenda, and via the online platform link accessible on the planning department's website, *https://sfplanning.org/hearings-hpc*.

Please note that public comments at the historic preservation commission hearing will not be treated as comments on the Draft EIR and will not be responded to in the Responses to Comments on the Draft EIR document (described below). These comments are made to the historic preservation commission as they develop the historic preservation commission's comments for the planning commission.

In addition, during the public review and comment period, members of the public are invited to submit written comments on the adequacy of the document, that is, whether this Draft EIR, including the initial study, identifies and analyzes the possible environmental impacts and identifies appropriate mitigation measures. Those who testify at the hearing on the Draft EIR or submit written comments and who provide an address (mailing or e-mail) will automatically receive a notification when the Responses to Comments on the Draft EIR document is available on the planning department website. Others may request such notification, or request a USB or paper copy, by contacting the EIR Coordinator, Jennifer McKellar, at *CPC.PotreroYardEIR@sfgov.org* or 628-652-7563.

Written comments should be submitted to:

Jennifer McKellar, EIR Coordinator
SFMTA Potrero Yard Modernization Project EIR
San Francisco Planning Department
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103

Or by e-mail to:

CPC.PotreroYardEIR@sfgov.org

Comments must be received by 5:00 p.m. on August 31, 2021. If attachments are provided as part of an e-mail comment on the Draft EIR, please provide them in a text-searchable pdf format, if possible.

Commenters are not required to provide personal identifying information. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the planning department's website or in other public documents.

Only commenters on the Draft EIR, including the initial study, will be permitted to file an appeal of the certification of the Final EIR to the San Francisco Board of Supervisors (board of supervisors).

Final Environmental Impact Report

Following the close of the Draft EIR public review and comment period, the planning department will prepare and publish a document entitled "Responses to Comments on the Draft EIR," which will contain a copy of all comments on this Draft EIR and the City's responses to substantive comments, and any necessary changes to the text, along with copies of the letters received and a transcript of the planning commission public hearing on the Draft EIR. This Draft EIR, together with the Responses to Comments document, will be considered by the planning commission in an advertised public meeting, and then certified as a Final EIR, if deemed adequate. The Responses to Comments document will indicate the date reserved for consideration of EIR certification at the planning commission.

The planning commission, the board of supervisors, and other decision-makers will use the information in the Final EIR in their deliberations on whether to approve, modify, or deny the proposed project or aspects of the proposed project. If the planning commission and the board of supervisors decide to approve the proposed project or project variants, their approval action must include findings that identify significant project-related impacts that would result; discuss mitigation measures or alternatives that have been adopted to reduce significant impacts to less-than-significant levels; and explain reasons for rejecting mitigation measures or alternatives if any are infeasible for legal, social, economic, technological, or other reasons.

A mitigation monitoring and reporting program must be adopted by the planning commission and the board of supervisors as part of the adoption of the CEQA findings and project approvals by those bodies. The mitigation monitoring and reporting program identifies the measures included in the proposed project or project variants or imposed by the decision-makers as conditions of approval, the entities responsible for carrying out the measures, and the timing of implementation.

If significant unavoidable impacts would remain after all feasible mitigation measures are implemented, the approving body, if it elects to approve the proposed project or project variants, must adopt a statement of overriding considerations explaining how the benefits of the proposed project or project variants would outweigh the significant environmental impacts.

D. ORGANIZATION OF THIS EIR

This EIR is organized into six chapters, as described below.

The **Summary** chapter provides a concise overview of the proposed project and project variants and lists the San Francisco Public Works Standard Construction Measures,[5] necessary approvals; the environmental impacts that would result from the proposed project or project variants; mitigation measures identified to reduce or eliminate these impacts; project alternatives; and areas of known controversy and issues to be resolved.

Chapter 1, Introduction, provides a summary of the proposed project and project variants and describes the type, purpose, and function of the EIR; the environmental review process and comments received on the NOP; and the organization of the EIR.

Chapter 2, Project Description, presents details about the proposed project and project variants and the approvals required for implementation.

Chapter 3, Environmental Setting and Impacts, includes an introductory section that describes the format of the chapter and a general discussion of the approach to the cumulative analysis. Chapter 3 addresses the following topics:

- Cultural Resources (historic architectural resources only)
- Transportation and Circulation (all topics)
- Noise and Vibration (all topics except aviation-related ones)
- Air Quality (all topics)
- Wind
- Shadow

Each topic section includes a description of existing conditions with respect to the particular environmental topic (environmental setting); the regulatory framework; the approach to analysis;

[5] San Francisco Municipal Transportation Agency, Memorandum from Jeff Tumlin, Director of Transportation, through Sarah Jones, SFMTA Planning Director and Andrea Contreras, SFMTA Environmental Review Team Lead; to Boris Deunert, San Francisco Public Works Regulatory Affairs Manager, SFMTA Commitment to Public Works Regulatory Affairs QA/QC Implementation Process and Standard Construction Measures, June 15, 2021.

identification and evaluation of project-specific and cumulative impacts; and mitigation measures and improvement measures, when appropriate.

Chapter 4, Other CEQA Considerations, addresses potential growth-inducing impacts of the proposed project and project variants and identifies significant effects that cannot be avoided if the proposed project or project variants is implemented, as well as significant irreversible impacts of the proposed project and project variants, and areas of known controversy and project-related issues that have not been resolved.

Chapter 5, Alternatives, presents and analyzes a range of alternatives to the proposed project or project variants. Four alternatives are described and evaluated: a No Project Alternative, which is required by CEQA; a Full Preservation Alternative; a Partial Preservation Alternative; and a Transit Facility Plus Commercial Only Alternative. This chapter also identifies the environmentally superior alternative. It discusses alternatives that were considered for analysis in the EIR but rejected and gives the reasons for their rejection.

Chapter 6, Authors and Persons Consulted, identifies the EIR authors and the agencies, organizations, and individuals consulted during preparation of the EIR. It also lists the project sponsor, their attorneys, and any consultants working on their behalf.

The EIR has nine appendices, as follows:

- Appendix A: Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting, August 19, 2020
- Appendix B: Initial Study – Potrero Yard Modernization Project (including Water Supply Assessment), June 30, 2021
- Appendix C: San Francisco Public Works Standard Construction Measures for Public Works Projects and Draft Construction Contract Procedures
- Appendix D: Historic Architectural Resources Evaluations
- Appendix E: Transportation and Circulation Calculation Details and Supporting Information
- Appendix F: Noise Measurement and Calculation Data
- Appendix G: Air Quality Calculation Details and Supporting Information
- Appendix H: Pedestrian Wind Study
- Appendix I: Shadow Analysis Report

For paper copies of the EIR, appendices are provided on a USB attached to the back cover of the EIR. The EIR Appendices are also available on the planning department's website at *sfplanning.org/sfceqadocs.* In addition, USB and paper copies of the Draft EIR and the EIR Appendices will also be made available by request by emailing *CPC.PotreroYardEIR@sfgov.org* or calling 628-652-7563. Referenced materials will also be made available for review upon request.

2. PROJECT DESCRIPTION

A. PROJECT OVERVIEW

The project sponsor, the San Francisco Municipal Transportation Agency (SFMTA), proposes to replace the Potrero Trolley Coach Division Facility at 2500 Mariposa Street (Potrero Yard). The proposed project would accommodate the expansion of the SFMTA's transit vehicle fleet in a new replacement structure with space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses. The new, approximately 1,300,000-gross-square-foot structure would occupy the 4.4-acre site and rise to heights ranging from approximately 75 to 150 feet across the site. The new structure would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the project as part of a joint development program between the SFMTA (project sponsor and property owner) and a private project co-sponsor (developer). Together the SFMTA and the private project co-sponsor are referred to as the project sponsor team. The joint development program would include a ground-floor commercial use and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit facility. The majority of residential development would be atop the replacement transit facility on floors 7 to 13. Four project variants are also considered: 1) the Emergency Exit Relocation Variant, which would relocate the bus emergency exit from 17th Street to Hampshire Street, 2) the Joint Development Lobby Relocation Variant, which would relocate a ground-floor joint development lobby from Mariposa Street to Hampshire Street, 3) the Active 17th Street Variant, which would relocate internal bus ramps from the north to south sides of the site to allow the mix of joint development uses to along 17th Street, and 4) the Employee and Family Support Variant, which would reprogram ground-floor commercial uses to include a family support/childcare use.

B. PROJECT OBJECTIVES

The SFMTA seeks to achieve the following set of basic and additional objectives by undertaking the proposed project or project variants:

BASIC OBJECTIVES

MODERNIZED POTRERO YARD TRANSIT FACILITY

- Rebuild, expand, and modernize the SFMTA's Potrero Bus Yard by 2026 to efficiently maintain and store a growing Muni bus fleet according to the SFMTA Fleet Plan and Facilities Framework schedule.

- Construct the first SFMTA transit facility with infrastructure for battery electric buses to facilitate Muni's transition to an all-electric fleet, in accordance with San Francisco and California policy.
- Construct a new public asset that is resilient to earthquakes and projected climate change effects, and provides a safe, secure environment for the SFMTA's employees and assets.
- Improve working conditions for the SFMTA's workforce of transit operators, mechanics, and front-line administrative staff through a new facility at Potrero Yard.

SFMTA FACILITIES FRAMEWORK AND BUILDING PROGRESS PROGRAM

- Achieve systemwide master plan priorities by consolidating two currently scattered transit support functions at Potrero Yard:
  - Improve and streamline transit operator hiring by consolidating the SFMTA's operator training function in a new, state-of-the-art facility.
  - Support efficient Muni operations by consolidating the Street Operations division in a modern, convenient facility.

COMMUNITY INPUT

- Implement inclusive and transparent stakeholder engagement in designing this project and completing the California Environmental Quality Act (CEQA) process.

RESPONSIBLE PUBLIC INVESTMENT

- Create a development that is financially feasible, meaning that the public asset can be funded by public means and public transportation funds are used only for the bus yard component.

ADDITIONAL OBJECTIVES

STREETSCAPE AND URBAN DESIGN

- Enhance safety and reduce conflicts between transit, commercial vehicles, bicyclists, drivers, and pedestrians in the project site vicinity.
- Improve the architectural and urban design character of the project site by replacing the existing fences and blank walls with more active, transparent street walls, to the extent feasible.

MIXED USE DEVELOPMENT AND HOUSING

- Maximize the reuse of this 4.4-acre site in a central, mixed-use neighborhood by creating a mixed-use development and providing dense housing and striving to maximize the number of affordable units on the site.
- Increase the City and County of San Francisco's (City) supply of housing by contributing to the Mayor's Public Lands for Housing goals, the San Francisco General Plan Housing Element goals, and the Association of Bay Area Governments' Regional Housing Needs Allocation for San Francisco by optimizing the number of dwelling units, including affordable housing, particularly near transit.
- Support transit-oriented development and promote the use of public transportation through an innovative and comprehensive transportation demand management program.

- Ensure that joint development is able to fund its own construction and ongoing management without reliance on City subsidy other than what is originally assumed as part of the project budget while ensuring that SFMTA's transportation funds are only allocated for the transit use.

SUSTAINABILITY

- Demonstrate the City's leadership in sustainable development by constructing an environmentally low-impact facility intended to increase the site's resource efficiency.[1]

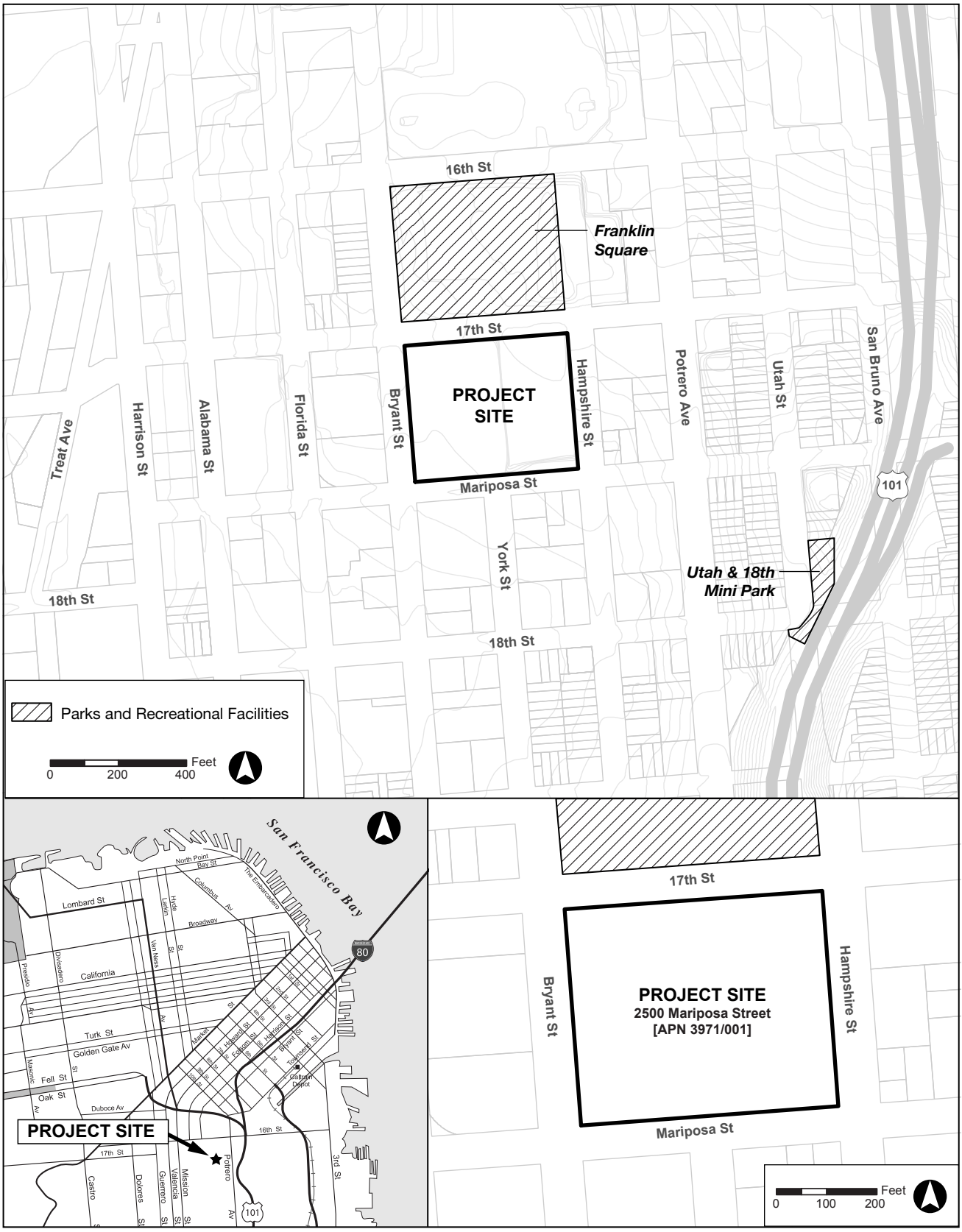
C. PROJECT LOCATION AND SITE CHARACTERISTICS

The project site is located in the northeast portion of San Francisco's Mission District near the South of Market and Potrero Hill neighborhoods (to the north and east, respectively). (See **Figure 2.1: Project Location**, p. 2.4.) The Potrero Yard site is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west and includes a trolley bus[2] storage yard and a maintenance and operations building. The project site is located across 17th Street from the approximately 4.4-acre Franklin Square open space and is approximately 0.25 mile west of U.S. Highway 101, approximately 0.5 mile east of the 16th and Mission Bay Area Rapid Transit District (BART) station, and approximately 0.5 mile north of San Francisco General Hospital.

The project site occupies the entirety of Assessor's Parcel 3971/001 and is owned by the City, through the SFMTA. The site is approximately 192,000 square feet (or 4.4 acres) and occupies the equivalent of roughly two typical city blocks (200 by 400 feet). The site is rectangular and measures approximately 480 feet along 17th and Mariposa streets and approximately 400 feet along Bryant and Hampshire streets. The western half of the site, as well as the vacated York Street right-of-way, is occupied by the asphalt-paved bus storage yard, which has a bus wash rack and running repair station along its northern and western edges, respectively. A fare collection shop and a defunct vacuum station are located on the east side of the bus yard near the maintenance and operations building in the former York Street right-of-way. The eastern half of the site is occupied by the predominantly single-story maintenance and operations building, which includes a second-floor parking deck and a second-story office level and maintenance bay along Mariposa and Hampshire streets, respectively. (See **Figure 2.2: Existing Site Plan**, p. 2.5.)

[1] The proposed project or project variants and each of the selected alternatives would be designed and constructed to meet the United States Green Building Council and Leadership in Energy and Environmental Design requirements at the Gold level.

[2] Trolley buses (or trolley coaches) along with buses (or motor coaches) are part of the SFMTA's rubber-tired bus fleet. These vehicles are different from other buses based on the propulsion system. That is, trolley buses are all-electric vehicles that operate on overhead wires, while buses are outfitted with either diesel or hybrid motors that operate with renewable fuels. San Francisco Municipal Transportation Agency, SFMTA Bus Fleet Management Plan 2017-2030, March 2017, pp. 12-14. This document and all other documents cited herein, unless otherwise noted, will be made available by request for review by emailing CPC.PotreroYardEIR@sfgov.org or calling 628-652-7563.

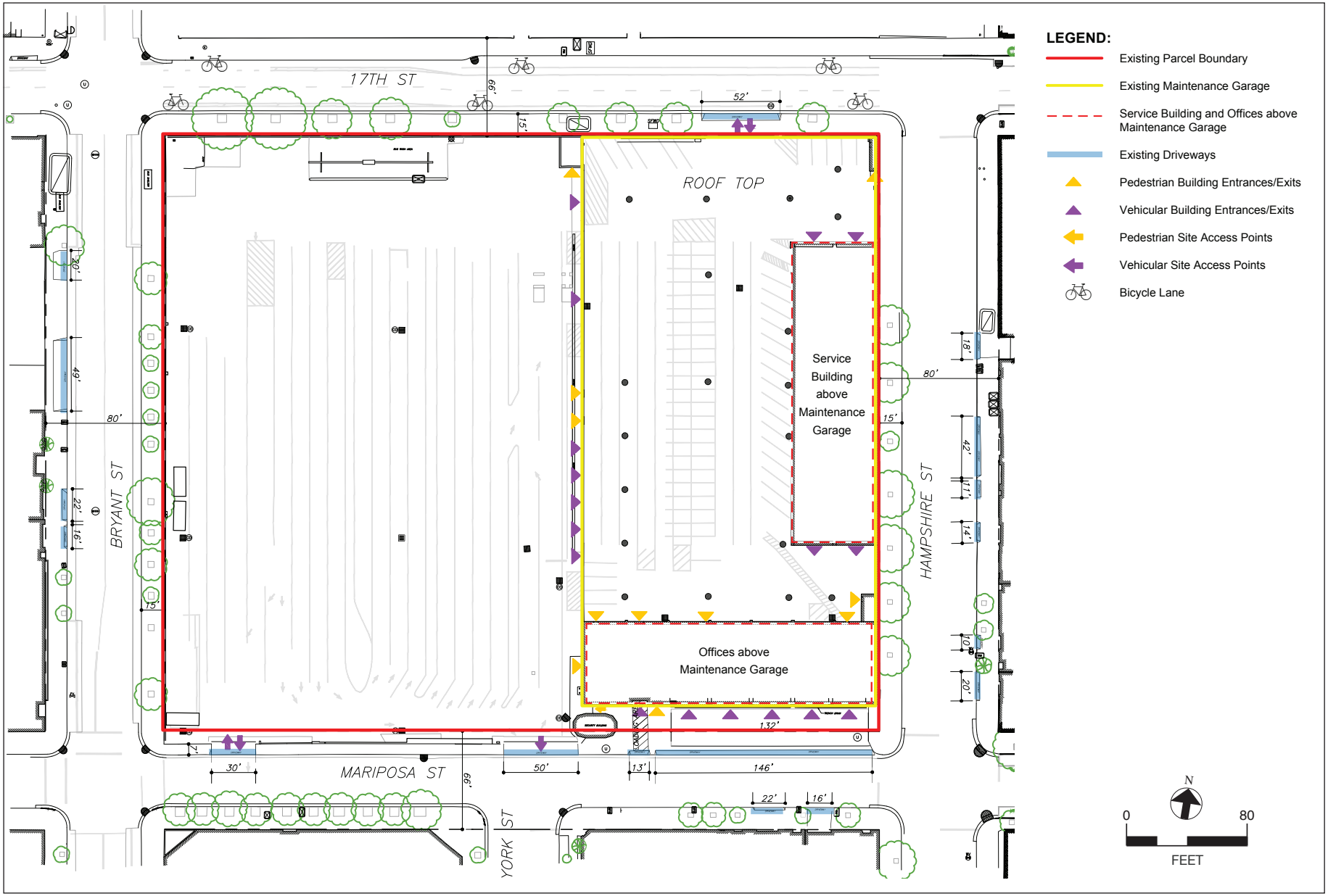


Source: SWCA, 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 2.1: PROJECT LOCATION



Source: Sitelab, 2020 and City & County of San Francisco

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 2.2: EXISTING SITE PLAN

The site slopes up toward the north and east (17th and Hampshire streets) and downhill toward the south and west (Mariposa and Bryant streets). The bus storage yard (or western portion of the site) has a gradual elevation change of approximately 6 feet due to a cut into the natural slope of the site. As a result, along the northern boundary of the site, the elevation of 17th Street is between approximately 14 and 22 feet higher than site grade with the high point at the corner of 17th and Hampshire streets. The elevation change along the other boundaries of the site is smaller or at the same grade as the bus storage yard.

EXISTING OPERATIONS

Potrero Yard operates 24 hours per day, 7 days a week, providing overnight bus storage and a location for street operations and bus maintenance activities. Potrero Yard has a design capacity for 138 buses that are 40 and 60 feet long. Transit service demands for Muni routes operating out of Potrero Yard requires 158 buses to be stored and maintained at Potrero Yard, with buses parked in circulation aisles and maintenance bays.[3] The buses operate on six Muni routes – 5 Fulton, 5 Fulton Rapid, 6 Haight/Parnassus, 14 Mission, 22 Fillmore, and 30 Stockton – and carry over 102,000 Muni customers each day.[4] In general, the peak period for buses leaving Potrero Yard to access their routes is between 4 a.m. and 7 a.m., with the majority leaving between 5 a.m. and 6 a.m. Buses generally return to Potrero Yard in the evening between 7 p.m. and 9 p.m. Owl routes 5, 14, and 22 also emanate from Potrero Yard, with buses leaving before midnight and returning before 6 a.m. to provide owl service.[5] Bus travel to and from Potrero Yard is considered non-revenue bus travel time (i.e., buses are not in service picking up and dropping off passengers; they are traveling to or from Potrero Yard and a terminus point where revenue service begins or ends). Potrero Yard has approximately 400 employees, including approximately 295 bus operators.[6]

EXISTING MAINTENANCE AND OPERATIONS BUILDING

The maintenance and operations building was originally constructed in 1915 as single-story, reinforced-concrete building and served as a streetcar maintenance garage with at-grade access from Mariposa Street. In 1924, the portions of the existing building along Mariposa and Hampshire streets were expanded to two stories (referred to throughout the Environmental Impact Report [EIR)]as the office wing and the shops wing). Between 1948 and 1949, the building was converted from a streetcar barn to a trolley coach facility. The maintenance and operations building covers less than 50 percent of the site. The rectangular building (215 by 370 feet) has a concrete perimeter foundation, a flat roof, and two double-height sections along its south (Mariposa Street) and east (Hampshire Street) sides. The building encompasses approximately 109,000 gross square feet. Due

[3] SFMTA, Short Range Transit Plan, Fiscal Year 2017-Fiscal Year 2030, June 6, 2017, Table 7: SFMTA Administrative, Operations, Maintenance, Fueling, Vehicle Storage and Staging Facilities, p. 19.
[4] SFMTA, Automatic Passenger Counts Data, 2019.
[5] SFMTA, Muni's late-night transit service is called the Owl network, *https://www.sfmta.com/getting-around/muni/routes-stops/muni-owl-service-late-night-transportation*, accessed March 26, 2021.
[6] SFMTA, Data Request Response, January 31, 2020, p. 2.

to the elevation change, the building's height varies, ranging from approximately 45 feet tall along the Mariposa Street frontage near Hampshire Street (the office wing), to approximately 10.5 feet tall along the Hampshire Street frontage near 17th Street.

Due to the change in grade between the north and south sides of the property, the first floor is below grade on 17th Street and fully at grade on Mariposa Street. Concrete retaining walls line the northern side of the site along 17th Street toward Bryant Street and a portion of the western side of the yard along Bryant Street toward 17th Street. The roof of the maintenance building is at grade along 17th Street west of Hampshire Street and is used as a parking deck. The second floor has additional maintenance shops (the shops wing) along the Hampshire Street side and offices along the Mariposa Street side (the office wing).

The building's first floor is accessed from the bus yard at its northernmost entry/exit bay near 17th Street and from Mariposa Street near Hampshire Street. It consists of a 10-lane maintenance space with 24 bays, including "heavy" and "running" repair bays,[7] shallow maintenance pits, machine and tire shops, maintenance staff rooms, storage rooms, and offices. Muni maintenance staff members use the maintenance pits to repair trolley buses; however, the maintenance pits are too shallow for most mechanics to stand upright. The ceiling is too low to lift a trolley bus high enough for mechanics to work on it from below. Consequently, a few heavy repair bays are now used for storage due to vertical clearance needs to accommodate modern trolley buses. As a result, many "heavy" repairs must be made outside in the bus yard. The second floor, accessed from 17th Street, consists of two maintenance bays with tire and light-duty body repair shops (the shops wing) and the office wing for the operations department which includes offices, training facilities, a dispatch office, men's and women's toilet rooms, a locker room, and a common room for the use of operators on break or between shifts. All the maintenance-related spaces on the first and second floors have indoor overhead catenary systems[8] attached to the ceilings to power the trolley buses.

Based on findings in the San Francisco Planning Department's (planning department's) Showplace Square Survey,[9] and as confirmed in the Historic Resource Evaluation for the Potrero Trolley Coach Division Facility, 2500 Mariposa Street,[10] the planning department determined that the

[7] Running repair bays serve as preventative maintenance and inspection for buses that are still powered. Heavy repair bays typically are used for more intensive bus maintenance activities that could require lifts and other mechanical systems for engine overhauls or major body repairs.

[8] Overhead catenary systems are located within Muni trolley bus maintenance facilities, outdoor bus yards, and along trolley bus routes throughout the City. These systems consist of overhead primary and bypass wires and related infrastructure (e.g., support poles up to 30-feet in height [if outdoors], conduit, and duct banks).

[9] San Francisco Planning Department, Showplace Square/Northeast Mission Historic Resource Survey, *https://sfgov.org/sfplanningarchive/showplace-squarenortheast-mission-historic-resource-survey*, accessed November 11, 2020.

[10] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, California, October 2, 2017, Section III, Regulatory Framework, p. 4. (See **EIR Appendix D-1**.)

maintenance and operations building is a moderately intact example of a municipal car barn and assigned the building a status code of "3CS".[11] This means that it is already listed in the California Register of Historical Resources and considered a historical resource for purposes of the California Environmental Quality Act (CEQA). The planning department's determination is based on the building's association with the early days of the San Francisco Municipal Railway (Muni), and in particular the expansion of Muni service south of Market Street (Criterion 1-Events) and as an example of a type (municipal car barn), period (World War I), method of construction (reinforced concrete), and the "work of a master," City Engineer Michael M. O'Shaughnessy (Criterion 3-Architecture/Design/Construction). The project site is not located within any known or potential historic district.[12]

EXISTING BUS STORAGE YARD AND OTHER PAVED AREAS

The site has several paved areas and curb cuts. The existing electrified bus storage yard on the western portion of the site (approximately 112,450 square feet) is the largest of the paved areas. The bus storage yard is paved with asphalt, with painted and numbered parking lanes in the center of the yard. Overhead catenary lines mounted on steel poles provide power for off-duty electric buses stored and serviced on the yard. Several workstations are located around its perimeter, including a bus wash rack on the north side, an outdoor running repair station on the west side, and a fare collection shop and a defunct vacuum station on the east side. An entry control booth, built in 1990, is located west of a 25-foot-deep setback on the southeast portion of the site along Mariposa Street adjacent to the bus storage yard's main entrance.

Ingress to the bus storage yard is provided by a 50-foot-wide curb cut and gated driveway on Mariposa Street immediately west of the entry control booth; egress is provided by a 30-foot-wide curb cut and gated driveway on Mariposa Street near Bryant Street.

Other paved areas and curb cuts on the project site are as follows:

- A second-floor parking deck on top of the maintenance and operations building on the northeast portion of the site near 17th and Hampshire streets. The second-floor parking deck is accessed via a 52-foot-wide curb cut and gated driveway on 17th Street near Hampshire Street. The second-floor parking deck is electrified with overhead catenary wires mounted on steel poles.
- A 25-foot-deep strip of asphalt in front of five openings on the south elevation of the maintenance and operations building along Mariposa Street.[13] This strip of asphalt is in

[11] San Francisco Planning Department, Historic Resource Evaluation Response, 2500 Mariposa Street, Part I: Historic Resource Evaluation, September 25, 2020, pp. 3-4. (See **EIR Appendix D-2**.)

[12] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, California, October 2, 2017, Section VI, Determination of Eligibility, p. 65. (See **EIR Appendix D-1**.)

[13] The 25-foot-deep setback at the southeast corner of site along Mariposa Street was originally required to allow streetcars, which cannot make 90 degree turns, sufficient clearance to turn off Mariposa Street into the building.

front of a continuous, approximately 146-foot-wide curb cut used by buses entering and exiting the building.

- A 13-foot-wide curb cut, used to access a parts storeroom receiving area located immediately west of the main pedestrian entrance and east of the entry control booth via Mariposa Street.

The bus storage yard and second-floor parking deck provide space for the following:

- 158 buses (sixty-five 40-foot and ninety-three 60-foot buses, requiring bus parking in circulation aisles and maintenance bays)
- 56 non-revenue vehicles[14] and employee vehicles, which are parked in striped parking spaces on the northeast side of the second-floor parking deck[15]
- 10 additional non-revenue vehicles, which are parked throughout the bus storage yard but not in marked spaces

In addition, one off-street loading space on the bus storage yard is located outside the parts storeroom receiving area east of the entry control gate on Mariposa Street. Off-street loading also occurs outside the maintenance bays on the second-floor parking deck.

Along 17th and Bryant streets and a portion of the Mariposa Street frontage, the bus storage yard is enclosed within 10-foot-high steel fencing topped with outward curving balusters.

EXISTING SITE ACCESS AND CIRCULATION

The project site is well served by public transit. Muni operates numerous surface buses within one block of the project site along Bryant Street, 16th Street, and Potrero Avenue, including the 9 San Bruno, 9R San Bruno Rapid, 22 Fillmore, 27 Bryant, 33 Ashbury/18th Street, and 55 16th Street routes.[16] Six Muni bus routes operate out of the Potrero Yard: the 5 Fulton, 5 Fulton Rapid, 6 Haight/Parnassus, 14 Mission, 22 Fillmore, and 30 Stockton routes, though with the exception of the 22 Fillmore on 16th Street, these routes do not pick up or drop off passengers in the vicinity of the site. Regional transit providers include BART, Golden Gate Transit, and San Mateo County Transit District (SamTrans). BART operates heavy rail regional trains, with the closest station (the 16th and Mission BART station) approximately 0.5 mile west of the site. Golden Gate Transit

[14] Non-revenue means the SFMTA does not use the vehicles to collect fares from passengers. Non-revenue vehicles include, but are not limited to, cars, minivans, pick-up trucks, cargo vans, super-duty trucks, and tanker trucks. SFMTA, Short Range Transit Plan, Fiscal Year 2017-Fiscal Year 2030, June 6, 2017, p. 81.

[15] Fifty-two striped parking spaces are currently being used for bus parking.

[16] The SFMTA reduced service to core routes only during the Shelter in Place order associated with the 2019-2021 COVID-19 pandemic. The SFMTA is gradually adding back service in 2021 and anticipates returning to full service by 2022. SFMTA, "Muni Plans to Reach 98% of San Francisco this August | SFMTA" May 25, 2021. *https://www.sfmta.com/blog/muni-plans-reach-98-san-francisco-august.* , access June 16, 2021.

operates surface buses along Mission and Eighth streets within 0.8 mile of the project site.[17] SamTrans operates four surface bus routes in San Francisco, including a commuter express bus route and a late night or owl route. SamTrans buses operate along Mission, Ninth, and Tenth streets, and along Potrero Avenue with drop-offs only in the northbound direction and pick-ups only in the southbound direction. The closest stops are located on Potrero Avenue and 24th Street (southbound only) and on Mission Street at Seventh, Eighth, and Ninth streets.[18]

Potrero Yard is not accessible to unaccompanied members of the public. Employees access the maintenance and operations building primarily from the entrance on Mariposa Street immediately east of the entry control booth. Bus, non-revenue vehicles, and staff vehicles can access Potrero Yard from Mariposa Street via the 44-foot-wide gate just west of the entry control booth and the five bus bays near Hampshire Street, accessed via the 50- and 146-foot-wide curb cuts, respectively; and from the second-floor parking deck, accessed via a 52-foot-wide curb cut and gated driveway on 17th Street west of Hampshire Street.

The streets adjacent to the project site, described below, are identified as mixed-use streets in the San Francisco Better Streets Plan (Better Streets Plan), which consists of illustrative typologies, standards, and guidelines for the design of the City's pedestrian environment, with the central focus of enhancing the livability of City streets:[19]

- 17th Street is an east-west street and is 66 feet wide with two travel lanes, striped bicycle lanes on both sides, and on-street parallel parking on the north side starting approximately 230 feet east of the Bryant Street intersection. Along this segment of 17th Street between Hampshire and Bryant streets, the bikeway is a signed class III facility with a striped lane in both directions and elements of a class IV facility (i.e., a separated bike lane and flexible posts) on the north and south sides near Bryant Street. The 17th Street bikeway continues east of Hampshire Street as a class II facility and west of Bryant Street as a mixed class II/class IV facility
- Hampshire Street is 80 feet wide with two travel lanes and perpendicular vehicle parking on both sides of the street.

[17] Golden Gate Transit, San Francisco System Map, *https://www.goldengate.org/assets/1/31/04_san_francisco3.21.pdf?6628*, and *https://www.goldengate.org/assets/1/31/map__sfcc3.21.pdf?6627*, accessed March 30, 2021.

[18] SamTrans, Schedules and Maps and Map of Downtown San Francisco, *https://www.samtrans.com/schedulesandmaps/timetables.html* and *http://www.samtrans.com/Assets/SamTrans/SCHEDULESandMAPS/System+Map/SamTrans+Downtown+SF+Map+PDF+01-2020.pdf*, accessed March 30, 2021.

[19] City and County of San Francisco, San Francisco Better Streets Plan, Policies and Guidelines for the Pedestrian Realm, December 7, 2010, *https://sfplanning.org/resource/better-streets-plan*, accessed March 30, 2021.

- Mariposa Street is 66 feet wide with two travel lanes and on-street parallel parking on the north side of the street between the two gated entry and exit points to the bus storage yard and on the south side between Bryant and York streets and York and Hampshire streets.[20]
- York Street terminates at Mariposa Street.
- Bryant Street is 80 feet wide with two north-south travel lanes, on-street parallel parking on both sides of the street, and Muni bus stops. The northbound (inbound towards Russian Hill) Muni bus stops are placed at the southeast corner of Bryant and Mariposa streets (south of the project site) and the southeast corner of Bryant and 17th streets (adjacent to the project site). The southbound (outbound towards the Mission) Muni bus stops are placed at the southwest corner of Bryant and 17th streets and the northwest corner of Bryant and Mariposa streets, both across the street from the project site.[21]

There are no on-street loading spaces adjacent to the project site.

The sidewalks adjacent to the project site along 17th, Hampshire, and Bryant streets are each 15 feet wide and meet the Better Streets Plan recommended sidewalk width. The Mariposa Street sidewalk is 7 feet wide and does not meet the minimum sidewalk width of the Better Streets Plan.[22] The existing bus storage yard encroaches on the Mariposa Street sidewalk right-of-way. Sidewalk elements include 27 street trees on the adjacent sidewalks: nine on 17th Street, seven on Hampshire Street, and 11 on Bryant Street. There are no street trees along the Mariposa Street frontage (see **Figure 2.2**, p. 2.5). Other sidewalk elements include the network of poles and overhead wires that serve the various Muni trolley buses maintained and stored at Potrero Yard. A Bay Area bicycle-share station with 19 bicycle docks is located at the northeast corner of Bryant and 17th streets, adjacent to the sidewalk.

EXISTING ZONING AND GENERAL PLAN DESIGNATION FOR THE PROJECT SITE

The project site is located within a Public Use (P) Zoning District, a public-use district that includes land owned by a government agency with some form of public use, including open space.[23] The project site is also within a 65-X Height and Bulk District, which means that the maximum allowable height on the site is 65 feet.[24, 25] An X designation for building bulk, such as that

[20] The existing facility encroaches on the Mariposa Street sidewalk right-of-way reducing the width of the sidewalk to 7 feet. Thus, the right-of-way is 58 feet – a 36-foot-wide roadway including parking lanes, and 7- and 15-foot-wide sidewalks on the north and south sides, respectively.

[21] There are class II striped bike lanes on each side of Bryant Street north of 17th Street.

[22] For this segment of Mariposa Street, the minimum and recommended sidewalk widths in the Better Streets Plan are 12 feet and 15 feet, respectively.

[23] San Francisco Planning Code, Article 2: Use Districts, Section 211.

[24] The maximum building height allowed on the project site is 65 feet. Bulk controls reduce the size of a building's floorplates as the building increases in height. Pursuant to the San Francisco Planning Code, Article 2.5: Height and Bulk Districts, Section 270(a), there are no bulk limits in an "X" Bulk District.

[25] San Francisco Planning Department, San Francisco Property Information Map, Step 1: 2500 Mariposa Street, and Step 2: Zoning Information, *http://propertymap.sfplanning.org*, accessed March 30, 2021.

applicable to the site, permits structures to cover the entire lot, without setbacks, up to the permitted height limit (subject to floor area ratio[26] and other controls). The entire project site is within the Mission Alcohol Beverage Special Use District and Fringe Financial Services Restricted Use District, which include zoning controls to address specific land use issues related to the sale of alcoholic beverages and establishment of new fringe financial services, respectively.[27] It is also within the area covered by the Mission District Streetscape Plan and the Mission Area Plan of the San Francisco General Plan.[28]

PROJECT VICINITY

Existing Setting

Zoning designations surrounding the project site include an additional Public (P) zone to the north (open space), along with a predominance of production, distribution, and repair (PDR) zoning to the south, east, and west, with Urban Mixed Use (UMU) to the northwest and beyond the PDR zones, and pockets of residential zones (Two-Family [RH-2] and Three-Family [RH-3]) to the northwest, south, and southeast. See **Initial Study Figure 1: Existing Zoning Districts** in **EIR Appendix B**, p. 6. Although P and PDR zoning districts do not have basic floor area ratio limits, the adjacent UMU-zoned parcels have basic floor area ratio limits of either 4.0 to 1 or 5.0 to 1, for non-residential mixed uses.[29] Most of the adjacent parcels have a 68-X height and bulk designation. However, a 58-X designated parcel is located to the east and northeast of the project site, and the Franklin Square open space parcel (P) to the immediate north has no designation. The parcel associated with the Potrero Center retail complex, two blocks north of the project site, has an 85-X designation. Height and bulk designations generally decrease to 58-X to the west and to 40-X to the east and south. See **Initial Study Figure 2: Existing Height and Bulk Districts** in **EIR Appendix B**, p. 7.

The entire project site and surrounding area is located within the Mission Area Plan and the Northeast Mission Industrial Zone, an area roughly north of 20th Street and east of South Van Ness Avenue in the Mission District. The Northeast Mission Industrial Zone includes larger traditional industrial facilities and PDR uses, including construction supply businesses, food processing and catering, graphic design, printing, photographic services, and communications uses such as radio broadcasting. These PDR businesses are in proximity to commercial, cultural, institutional, and

[26] Floor area ratio (sometimes called FAR) is the ratio of the sum of the gross floor area of all buildings on a lot to the area of the lot.
[27] San Francisco Planning Code, Article 2: Use Districts, Sections 249.35 and 249.60.
[28] San Francisco Planning Department, San Francisco General Plan, Eastern Neighborhoods Planning Areas, *http://generalplan.sfplanning.org/images/eastern_neighborhoods_map.pdf*, accessed March 30, 2021.
[29] San Francisco Planning Code, Article 1.2: Dimensions, Areas and Open Spaces, Section 124: Basic Floor Area Ratio.

public and quasi-public uses, as well as live/work lofts and residential uses in enclaves of small-lot Victorian and Edwardian-era homes mixed with the non-residential uses.[30]

The project site's immediate vicinity is characterized by a mix of industrial, commercial, and residential one- to three-story buildings with a diverse range of building types and architectural styles, and Franklin Square. Industrial and commercial land uses, including smaller-scale food services, are interspersed with residential land uses throughout the surrounding blocks to the south, east, and west across Mariposa, Hampshire, and Bryant streets, respectively. A cluster of commercial and retail uses is located to the north in or along the Potrero Center retail complex. Public and institutional uses include the San Francisco SPCA Mission Pet Adoption Center, a soup kitchen, a youth and family services center, a public video production training studio, and a U.S. Post Office. Other businesses in the project vicinity include a United Parcel Service retail center, gas stations and auto repair shops, Oberlin Dance Collective (a dance studio), and Mission Cliffs (a climbing gym).

Franklin Square occupies the lot to the north of the project site, across 17th Street. The park is under the jurisdiction of the San Francisco Recreation and Park Commission. It includes a turf soccer field at the center of the park and picnic areas, a children's playground, and landscaping along the perimeter.

West of the project site across Bryant Street, the area is developed primarily with residential uses in three-story buildings ranging from 40 to 48 feet tall. There is also a two-story commercial building with a surface parking lot and storage area.

The areas to the south and east of the project site, on the south side of Mariposa Street and on the east side of Hampshire Street, are characterized by a mix of commercial, industrial, retail, and residential spaces in one- to three-story buildings. Uses include KQED (public radio/television); other media production land uses (including television, music, and photography); PDR land uses including stone supply, custom upholstery, and large format printing; and retail (a corner café/restaurant). In addition to Franklin Square, nearby park and recreational uses include Utah and 18th Street Mini-Park (to the southeast) and In Chan Kaajal Park (to the west near 17th and Folsom streets).

Approved projects in the area that were recently completed include 2000-2070 Bryant Street (i.e., within a 0.25-mile radius). This project is bounded by 18th Street to the north, Bryant Street to the east, an existing building to the south, and Florida Street to the west. It required the demolition of six existing buildings (collectively 68,690 square feet) and the construction of a six-story, 68-foot-

[30] San Francisco Planning Department, Eastern Neighborhoods Rezoning and Area Plans Final EIR, August 7, 2008, pp. 44-45, *https://archives.sfplanning.org/documents/3995-EN_Final-EIR_Part-3_Land-Use_Plans.pdf*, accessed March 30, 2021.

tall, mixed-use building (approximately 221,035 square feet) with 274 residential units and 5,100 square feet of ground-floor retail.

Transit Service

The project site is located adjacent to and nearby several Muni bus transit lines. The following six surface bus routes are located within one block of the project site along Bryant Street, 16th Street, and Potrero Avenue: 9 San Bruno, 9R San Bruno Rapid, 22 Fillmore, 27 Bryant, 33 Ashbury/18th Street, and 55 16th Street.

The 27 Bryant bus route travels along Bryant Street adjacent to the project site, with northbound and southbound bus stops located at 17th Street and at Mariposa Street. The northbound 27 Bryant bus stop at 17th Street is adjacent to the project site and has a transit shelter. The northbound 27 Bryant bus stop located at Mariposa Street is not adjacent to the project site; it is located on the southeast corner of Mariposa Street. The two southbound 27 Bryant bus stops are west of the project site across Bryant Street between Mariposa and 17th streets.

The 22 Fillmore and the 55 16th Street bus routes travel along 16th Street, with eastbound and westbound bus stops located at Bryant Street and at Potrero Avenue.

The 33 Ashbury/18th Street bus route travels along 16th Street and Potrero Avenue, with eastbound and westbound bus stops located on 16th Street at Bryant Street and at Potrero Avenue, and on Potrero Avenue at Mariposa Street.

The 9 San Bruno and the 9R San Bruno Rapid bus routes run along Potrero Avenue. The nearest northbound and southbound bus stops for this route are located on Potrero Avenue at Mariposa Street and at 16th Street.

Additionally, four Muni routes (8 San Bruno, 8AX San Bruno Express, 8BX San Bruno Express, and 14X Mission Express) travel on U.S. 101, approximately 900 feet east of the project site, but do not stop.

D. PROPOSED PROJECT

The SFMTA proposes to replace the Potrero Yard at 2500 Mariposa Street. The project would accommodate the expansion of the SFMTA's transit vehicle fleet and the modernization of bus maintenance, operation, and administrative services. The project would also accommodate the expansion and consolidation of training operations, currently sited elsewhere, in one location. In addition, the proposed project includes joint development in conjunction with a housing developer consisting of a mix of uses, such as residential uses within and atop the replacement transit facility and ground-floor commercial uses along Bryant Street.

In addition, the proposed project includes four variants that consider modifications to limited features or aspects of the project (see "Project Variants," p. 2.56-2.58).

PROJECT BACKGROUND

The proposed project is part of the SFMTA's 20-year Building Progress Program to expand and modernize its facilities to meet growing transportation demands and changing technologies.[31, 32] In addition to the Potrero Yard, the SFMTA operates five other bus yards, sometimes referred to as "divisions": Presidio Yard (949 Presidio Avenue), Flynn Division (1940 Harrison Street), Woods Yard (1095 Indiana Street), Islais Creek Division (1301 Cesar Chavez Street), and Kirkland Yard (2301 Stockton Street and 151 Beach Street).[33]

The SFMTA is increasing its transit fleet to meet growing transportation demands (see **Table 2.1: SFMTA Transit Fleet Plan and Facility Planning Capacity**, p. 2.16). The 2014 Transit Fleet Management Plan along with the 2017 Rubber Tire Update and 2017 Plan for Historic Street Car Service constitutes the SFMTA's transit fleet plan.[34] Without expanding or adding a bus facility by 2025, the SFMTA will have 89 more rubber-tired buses than the planning capacity for its six current facilities; by 2030, that number will increase to 144.[35] In addition, its oldest transit facilities – the Potrero, Presidio, and Kirkland yards – were not built for the buses they currently store and are not equipped with adequate bus maintenance infrastructure or equipment, including bus lifts. The Potrero and Presidio yards were built for streetcars and modified for buses within their existing footprints; consequently, bus storage and maintenance at these facilities is constrained. They also do not meet the needs of new bus types or technologies such as battery-electric bus infrastructure. SFMTA therefore undertook a planning process for expanded and modern transit facilities.[36]

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[31] SFTMA, Building Progress Public Outreach Boards, January 24, 2018, p. 5.
[32] SFMTA, 2017 SFMTA Facilities Framework, January 20, 2017, p. 8.
[33] SFMTA, 2017 SFMTA Facilities Framework, January 20, 2017, p. 14.
[34] SFMTA, 2017 SFMTA Facilities Framework Addendum, October 6, 2017, Appendix 1: Transit Fleet Data, p. 15.
[35] SFMTA, 2017 SFMTA Facilities Framework Addendum, October 6, 2017, Appendix 1: Transit Fleet Data, p. 17. Planning capacity includes all marked bus storage spaces plus parking lanes/tracks and half of the maintenance bays.
[36] SFMTA, 2017 SFMTA Facilities Framework, January 20, 2017, p. 8.

Table 2.1: SFMTA Transit Fleet Plan and Facility Planning Capacity

	2020					2025					2030					2035					2040				
Bus NOTE A	**30′**	**40′**	**60′**	**T**	**M**	**30′**	**40′**	**60′**	**T**	**M**	**30′**	**40′**	**60′**	**T**	**M**	**30′**	**40′**	**60′**	**T**	**M**	**30′**	**40′**	**60′**	**T**	**M**
Fleet Plan	30	357	224	**611**		30	365	269	**664**		30	365	342	**737**		30	365	324	**719**		30	365	324	**719**	
Flynn			126		14			128		14			128		14			109		14			109		14
Islais		40	98		19		40	98		19			129		19		81	72		16		81	72		19
Kirkland		115			3		123			3		135			3							81			9
Woods	30	202			26	30	202			26	30	228			26	30	228			26	30	203			26
Marin or Other								43		4		2	28		4		56			4					
Potrero													57		4			150		18			145		18
Facility Capacity	30	357	224	**611**	**62**	30	365	269	**664**	**66**	30	365	342	**737**	**70**	30	365	331	**726**	**78**	30	365	326	**721**	**86**
Trolley NOTE A		**40′**	**60′**	**T**	**M**		**40′**	**60′**	**T**	**M**		**40′**	**60′**	**T**	**M**		**40′**	**60′**	**T**	**M**		**40′**	**60′**	**T**	**M**
Fleet Plan		185	93	**278**			185	93	**278**			185	93	**278**			185	93	**278**			185	93	**278**	
Potrero		20	93		22							63	93		18			56		6			61		6
Presidio		165			14		165			14							185	40		20		185	32		20
MME Expansion							20	93		12		122			12					12					12
Facility Capacity		185	93	**278**	**26**		185	93	**278**	**26**		185	93	**278**	**30**		185	96	**281**	**38**		**185**	**93**	**278**	**38**

Notes: T = Total; M = Maintenance Bay; shaded band indicates facility/site not available for use

NOTE A Bus and trolley lengths denoted with symbol indicating feet, i.e., 30-foot-long, 40-foot-long, and 60-foot-long

Source: SFMTA, 2017 SFMTA Facilities Framework Addendum, October 6, 2017, Appendix 1: Transit Fleet Data, Fleet Plan and Facility Capacity Table 1 - Existing Facilities and Fleet Plan and Facility Capacity Table 3 - Scenario 2A, pp. 17 and 19, respectively.

In 2015, the SFMTA began a facility condition assessment to identify deficiencies and repair costs as a basis for budgeting and prioritizing improvements, as well as a means of identifying major space planning opportunities and ways to improve processes for facility planning and management.[37] SFMTA staff held internal staff workshops with front-line transit operations and maintenance staff and management in late 2015, early 2016, mid-2016, and late-2016. SFMTA staff presented a Facilities Framework to the SFMTA Executive Team in December 2016. The SFMTA Executive Team provided direction to study three development scenarios: Scenarios 1A and 1B, which propose smaller rebuilt facilities because they assume an additional new site, and Scenario 2A, which optimizes use of the SFMTA's existing sites, including replacing Potrero Yard.[38]

The transit fleet plan maps out a systematic approach to the ongoing management and planning for rehabilitation and replacement of the SFMTA's fleet of transit vehicles through 2040. The objectives of the transit fleet plan include the following: to accommodate the transit service expansion identified in the SFMTA's Transit Effectiveness Project (currently being implemented as Muni Forward), and to provide information necessary to plan for the SFMTA's storage and maintenance facility needs to accommodate that service expansion. As noted above, this internal effort brought multiple SFMTA divisions (as well as other City agencies) together to determine how to accommodate transit fleet growth, consolidate operations to improve service, replace and/or seismically upgrade critical transit facilities to accommodate changing bus vehicle technologies and maintenance needs, improve employee working conditions, and meet other objectives such as the potential for developing a mix of uses in addition to transit facility replacements, upgrades, and expansions at opportunity sites such as the Potrero, Presidio, and Kirkland yards.

In November and December 2017 and January and December 2018, the SFMTA held public meetings to discuss the critical need to modernize SFMTA facilities such as Muni yards, maintenance shops, and paratransit facilities.

The SFMTA held public workshops on the redevelopment of the Potrero Yard in December 2018 and in February, August, and October 2019. The SFMTA also conducted two years of internal design and planning work and coordinated with the Potrero Yard Neighborhood Working Group.[39]

Based on those efforts, the SFMTA decided to study only Scenario 2A further. This scenario proposes rebuilding the three oldest facilities – the Potrero, Presidio, and Kirkland yards – and

[37] SFMTA, 2017 SFMTA Facilities Framework, January 20, 2017, p. 6.
[38] SFMTA, 2017 SFMTA Facilities Framework, January 20, 2017, p. 10.
[39] The Potrero Yard Neighborhood Working Group has approximately 15 members selected by the SFMTA in consultation with the Supervisors of Districts 9 and 10. Each seat represents a specific interest in elements of the project, *https://www.sfmta.com/reports/potrero-yard-neighborhood-working-group-application-form*, accessed May 10, 2021.

considers the potential for additional joint development on these sites. The SFMTA is proposing to proceed with Potrero Yard first, as described herein.

The City, acting by and through the SFMTA, will select a master developer (or a development consortium) to redevelop the 4.4-acre site through a developer selection process consisting of a request for qualifications (released August 2020) and a subsequent request for proposals (spring 2021) from the qualified candidates. The SFMTA anticipates selecting a developer in September or October 2021 and contracting with a developer by November 2021. The planning department will evaluate whether any future changes from the project sponsor team to the project description presented herein would necessitate additional environmental review.[40]

In addition, the development consortium selected to provide the final project design and deliver the public and private components of proposed project will include, as part of the agreement with the City, the implementation of San Francisco Public Works Standard Construction Measures (described below under "Project Construction," p. 2.48).[41] Further, the SFMTA will ensure that requirements of various City ordinances and regulations related to the City's efforts to reduce greenhouse gas emissions (i.e., the compliance process for best practices such as clean construction, resource conservation, and transportation demand management as well as sustainable construction, building management/operations, and materials purchasing practices among others) are followed, as applicable, for the joint development. See the discussion of Leadership in Energy and Environmental Design (LEED) strategies under "Proposed Sustainability Program," p. 2.48.

The project's characteristics as they would appear if decision-makers approve the proposed project are described below and summarized in **Table 2.2: Summary of Existing and Proposed Project Characteristics**, pp. 2.22-2.23. However, as with most large development projects, aspects of the proposed project's conceptual design may change and will become more detailed as a result of the CEQA process, technical design modifications, planning and building department application submittal requirements, and input from the planning department, the community, the selected project developer, and other stakeholders. For example, the project's massing, presented in **Figure 2.4: Proposed Massing – South (Mariposa Street) Elevation** through **Figure 2.7: Proposed Massing – East (Hampshire Street) Elevation** and rendered as photo simulations in **Figure 2.8: Proposed View Looking South From Franklin Square** through **Figure 2.11: Proposed View Looking North From Bernal Heights** on pp. 2.25-2.32 may be

[40] Refer to CEQA Guidelines sections 15088.5 "Recirculation of an EIR prior to certification" and 15162 "Subsequent EIRs and Negative Declarations" for more details regarding the criteria applicable to the department's evaluation of refinements to the project description. Such subsequent environmental review may include revisions to the draft EIR, a subsequent EIR or addendum or similar documentation.

[41] San Francisco Municipal Transportation Agency, Memorandum from Jeff Tumlin, Director of Transportation, through Sarah Jones, SFMTA Planning Director and Andrea Contreras, SFMTA Environmental Review Team Lead; to Boris Deunert, San Francisco Public Works Regulatory Affairs Manager, SFMTA Commitment to Public Works Regulatory Affairs QA/QC Implementation Process and Standard Construction Measures, June 15, 2021.

further refined from the maximum envelope analyzed as part of the CEQA analysis to a more refined architectural expression in response to project-specific urban design guidelines to be developed in coordination with the planning department as part of the SFMTA's developer selection process and through the planning department's design review process.

The amount of floor space dedicated to internal ramps and bus circulation (463,000 gross square feet) for the 40- and 60-foot-long trolley buses is the result of rigorous site optimization efforts for maximizing a three-level replacement transit facility on a 4.4-acre site to best accommodate the bus storage and maintenance space needs for the projected transit fleet growth. SFMTA transit fleet projections and facility capacity studies indicate the potential need for the future Potrero Yard to accommodate more buses (216) and maintenance bays (24) than can fit on site with the current three-level design built out to the property lines and set back five feet along the 17th Street frontage.

The planning department will evaluate whether any future changes from the project sponsor team to the project description presented herein would necessitate additional environmental review, because, for example, the proposed change would result in new or more substantial significant impacts. Information presented in this document, e.g., existing Muni services and operations at Potrero Yard described above under "Existing Operations" on p. 2.6, is from data collected prior to the onset of the COVID-19 pandemic and before any subsequent changes in public or private business and enterprise practices. Data collected for the proposed project's impact analyses and the changes in practice during the COVID-19 pandemic are discussed in the relevant sections of the EIR and initial study, e.g., **EIR Section 3.C, Transportation and Circulation** and **EIR Section 3.D, Noise and Vibration**.

PROJECT CHARACTERISTICS

The proposed project would demolish the existing bus storage yard and the maintenance and operations building and would replace them with a new, approximately 75- to 150-foot-tall,[42] up to 1,300,000-gross-square-foot structure. The proposed structure would cover the entire lot, except for a 5-foot setback from 17th Street (see **Figure 2.3: Proposed Site Plan**). The characteristics of the proposed development are summarized below in **Table 2.2**, pp. 2.22-2.23.

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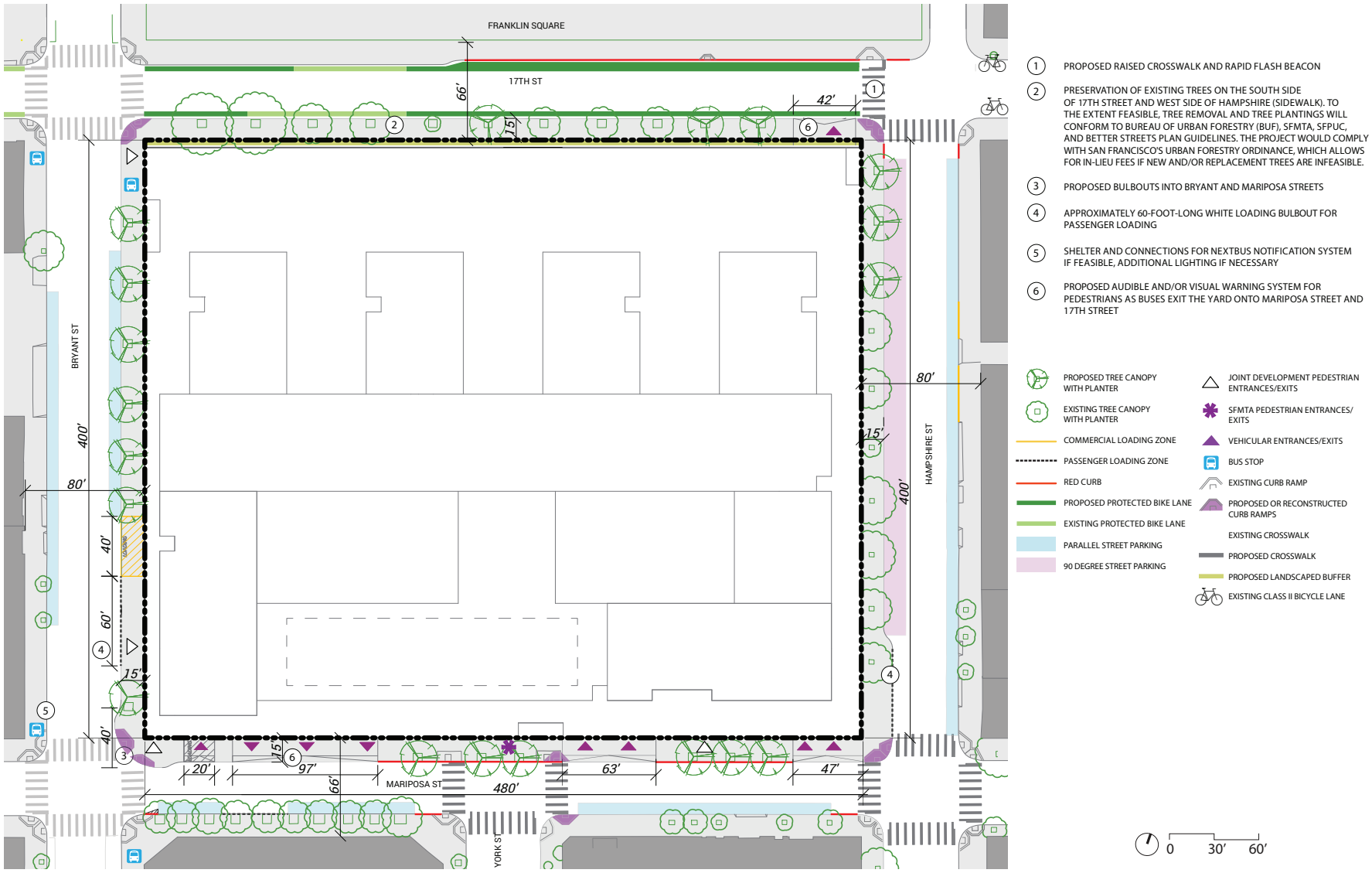
[42] Maximum building height would be measured from grade at the midpoint of the property boundary along each elevation pursuant to section 260 of the planning code.



Source: SFMTA and Sitelab, 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 2.3: PROPOSED SITE PLAN

As shown in **Table 2.2**, the proposed structure would contain an approximately 723,000-gross-square-foot replacement transit facility and up to 577,000 gross square feet of joint development uses. The replacement transit facility would have three transit levels and a portion of the joint development, with integrated residential and commercial uses proposed along the Mariposa Street and Bryant street frontages (for a total of six joint development floors within the three-level replacement transit facility). Much of the residential portion of the joint development program would be developed within the three to seven floors proposed to rise above the replacement transit facility, i.e., on joint development floors 7 through 13. The tallest portion of the additional residential development atop the replacement transit facility would be closest to Mariposa Street on the site's south side. Useable open space (see **Table 2.2**) would be developed on the rooftop of the replacement transit facility, e.g., where the structure is set back from the property lines.

The three new transit levels in the replacement transit facility would be designed to include adequate space for circulation (ramps, drive aisles, and vertical circulation), parking for 213 buses, 18 maintenance bays and maintenance support areas, operations, an SFMTA operator training center, storage (parts and battery-electric infrastructure), administrative uses/common areas (e.g., offices, conference rooms, break rooms), and joint development uses.[43] A total of 310 vehicle spaces would be provided: 63 spaces for the 40-foot-long buses, 150 spaces for the articulated 60-foot-long buses, and 97 parking spaces for large and standard non-revenue vehicles. The project is not proposing any off-street accessory vehicular parking for the entirety of the project, including the proposed joint development. (See **Table 2.2** for the parking breakdown and the approximate floor areas for the replacement transit facility.) Ramps would provide one-way internal driveways within the replacement transit facility so that buses can access the work bays, bus wash bays, and parking spaces on the three new transit levels.

The proposed joint development uses within the replacement transit facility (ground-floor commercial and residential) and proposed residential uses on the up to seven floors atop the replacement transit facility would include space for up to 575 residential units.[44, 45] Up to 33,000 gross square feet of ground-floor commercial use would also be developed along Bryant Street. (See **Table 2.2** for the breakdown of units by unit type and for approximate floor areas for the residential and commercial uses.)

[43] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: Bus Facility Design Criteria Document, June 2019, Section 3.3 (Potrero Facility Scenario 2), p. 27.

[44] Joint development floors within the replacement transit facility would include residential units on floors 2 through 6, with commercial uses and residential lobbies at the ground floor along Mariposa and Bryant streets, as currently shown on **Figure 2.13** through **Figure 2.18**, pp. 2.37-2.42. Each of the floors would include a mix of the proposed joint development and transit facility uses.

[45] Current financial model assumes that residential units proposed for development within the replacement transit facility would be below market rate units while those developed atop the replacement transit facility would be a combination of market rate and below market rate units.

Table 2.2: Summary of Existing and Proposed Project Characteristics

Building Characteristics	Demolished	New [NOTE A]
Paved Bus Storage Yard	**112,450 sq. ft.**	–
Total Building Floor Area	**109,000 gsf** [NOTE B]	**1,300,000 gsf**
Ramps and Circulation		463,000 gsf
Service/Storage (Basement)		127,000 gsf
Service/Storage (Non-Basement)		59,000 gsf
Administration and Common Area		52,000 gsf
Shared Basement Circulation (Ramps and Drives)	–	22,000 gsf
Transit Facility Subtotal	**221,450 gsf** [NOTE C]	**723,000 gsf**
Residential (Units)	–	394,000 gsf
Residential (Circulation, Common Area, Property Management, Service, Storage)	–	150,000 gsf
Residential Development Subtotal	–	**544,000 gsf**
Commercial Use	–	33,000 gsf
Commercial Development Subtotal	–	**33,000 gsf**
Height	**10.5 – 44 feet**	**75 – 150 feet** [NOTE D]
Levels or Floors	**1 to 2**	**3 to 13**
Residential Units	**0**	**575**
Two- to Three-Bedroom	–	228
One-Bedroom	–	206
Studio	–	141
Vehicle Parking Spaces	**214**	**310**
Buses (40 foot / 60 foot)	158 (65/93)	213 (63/150)
Non-Revenue Vehicles (large / standard)	56	97 (8/89)
SFMTA Staff	–	0
Residential	–	0 [NOTE E]
Maintenance Repair Bays	**24**	**18**
Loading Supply (On-Street Zones/Off-Street Spaces)	**0 curb feet (0/1)**	**160 curb feet (3/2)**
Commercial (On-Street/Off-Street)	0 curb feet (0/1)	40 curb feet (1/2)
Passenger (On-Street/Off-Street)	–	120 curb feet (2/0) [NOTE F]
Bicycle Parking Spaces [NOTE G]	**5**	**773**
Class 1	0	736
Class 2	5	37
Useable Open Space – Atop Replacement Transit Facility	–	**91,000 sq. ft.**
At-Grade Open Space – Green Buffer along 17th Street	–	**2,400 sq. ft.**

Notes: gsf = gross square feet; sq. ft. = square feet

NOTE A Numbers rounded to closest 1,000 gsf or sq. ft. and correspond to the current conceptual design of the proposed project. The values presented are the expected maximum size for each component to provide a conservative analysis of impacts. The floor areas of the final design may result in variances from the values presented.

NOTE B Includes space for bus circulation, service, storage, administrative offices, and common areas.

NOTE C Includes the paved bus storage yard.

NOTE D The replacement transit facility would have three levels and be approximately 75 feet tall, as measured from grade at the midpoint of the property boundary along each elevation pursuant to San Francisco Planning Code (planning code) section 260.
NOTE E Up to 12 car-share spaces may be provided at the basement level.
NOTE F Two separate 60-foot-long zones.
NOTE G Class 1 bicycle parking facilities are spaces in secure, weather-protected facilities intended for use as long-term, overnight, and workday bicycle storage by unit residents, non-residential occupants, and employees. Class 2 spaces are bicycle racks located in publicly accessible and highly visible locations intended for transient or short-term use by visitors, guests, and patrons to the building or use. Class 2 bicycle racks allow the bicycle frame and one wheel to be locked to the rack (with one U-shaped lock) and provide support to bicycles without damage to the wheels, frame, or components (planning code section 155.1).
Source: SFMTA, 2020.

Circulation space for the proposed transit, residential, and commercial uses would be provided at the basement level and each of the six joint development floors within the replacement transit facility. Residential levels within the replacement transit facility would be accessed via vertical circulation access points that preserve the security of the SFMTA facility and that are safe and functional for the joint development. Access to the residential levels atop the replacement transit facility would be provided via separate residential circulation elevators and stairs. A secure access system would be installed to restrict access to various floors to authorized individuals (e.g., residents only at the residential floors and SFMTA employees only at SFMTA floors).

The proposed project would also include changes within the Mariposa Street, 17th Street, Bryant Street, and Hampshire Street rights-of-way, as discussed below under "Proposed Changes in Street Rights-of Way" beginning on p. 2.44.

During construction, the bus parking, operations, and maintenance support functions would temporarily relocate to the Muni Metro East Light Rail Vehicle Facility (601 25th Street) and the 1399 Marin Facility.[46] Alternatively, the existing Potrero Yard transit fleet of 158 buses (sixty-five 40-foot-long buses and ninety-three 60-foot-long buses) may also be parked and maintained at other SFMTA facilities. The existing Presidio, Kirkland, and Woods yards could accommodate the 40-foot-long buses and the existing Flynn and Islais Creek divisions and the 1399 Marin Facility could accommodate the 60-foot long buses.[47] The SFMTA estimates that the replacement transit facility would have a total employment population of approximately 829 full-time equivalent persons, including 383 operators – an increase from 400 employees under existing conditions.[48] Potrero Yard would continue to operate as a 24/7 facility. On average, approximately 100 SFMTA

[46] The 180,000-square-foot Muni Metro East Light Rail Vehicle Facility is located along the Central Waterfront on Illinois and 25th streets in the Dogpatch/Bayview neighborhood, a block from the T Third Street Line. The 1399 Marin facility at Marin and Indiana streets, also located in the Dogpatch/Bayview neighborhood and in close proximity to the T Third Street Line, is currently used for receiving new transit vehicles and testing them before they are introduced into the overall transit fleet.
[47] SFMTA, Muni Metro East Memo, February 26, 2021 and SFMTA e-mail communication with the planning department, March 15, 2021.
[48] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: 3-Level Bus Facility Design Criteria Document, June 2019, Section 2.1 (Staff Summary), p. 11.

staff would be on site at any given time, with a peak of 181 SFMTA staff from noon to 3 p.m. and 60 to 80 staff from 6 p.m. to 3 a.m.[49]

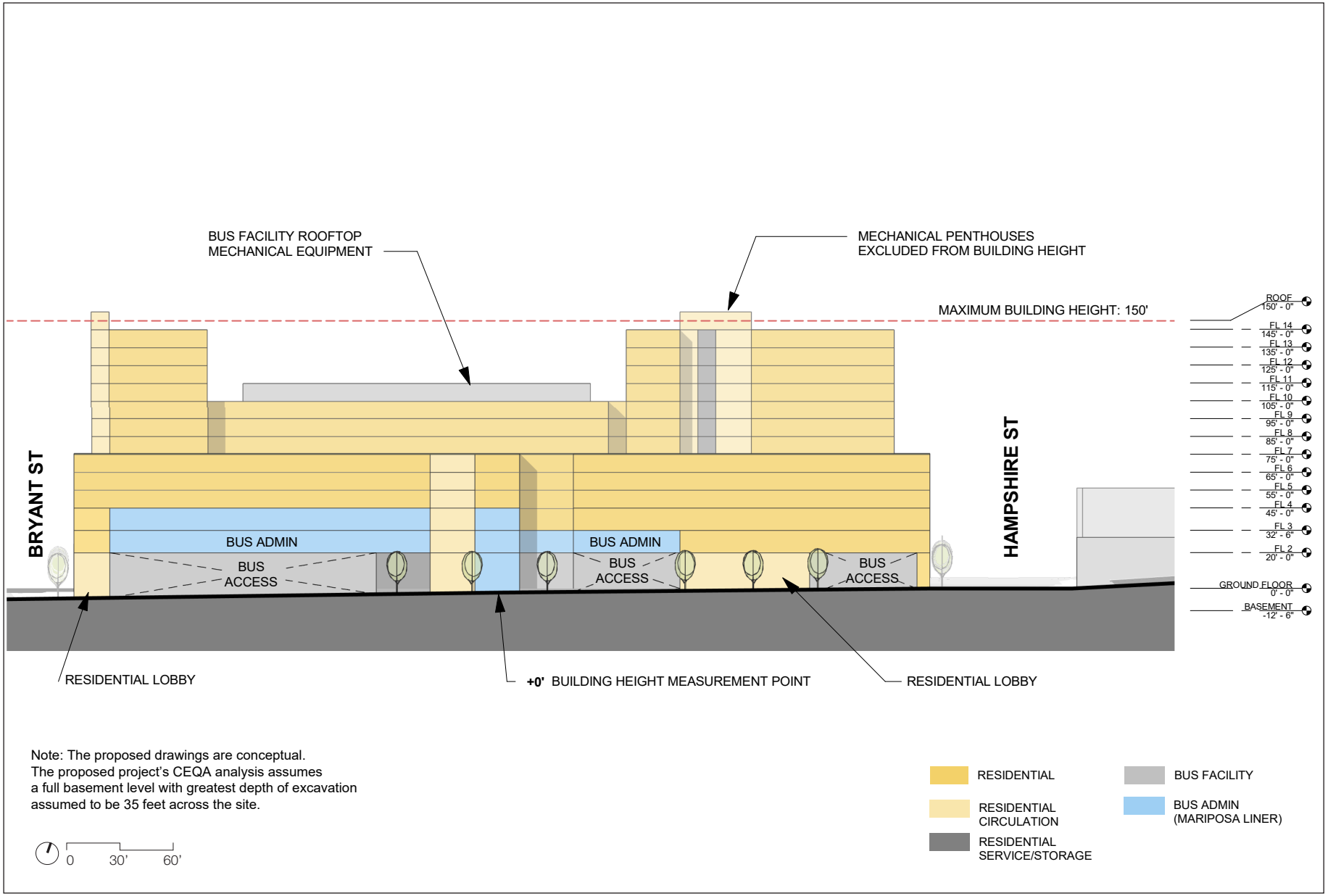
PROPOSED BUILDING FORM AND DESIGN

The proposed new structure would occupy the site up to the property lines, except along the 17th Street frontage, due to the 5-foot setback. The project includes a replacement transit facility at approximately 75 feet in height as measured to the top of the roof from grade at the midpoint of the property boundary along each elevation. The three- to seven-story residential structures atop the replacement transit facility would be approximately 30 to 70 feet tall as measured to the top of the roof (exclusive of any mechanical penthouses that would be centrally located on rooftops). The tallest portion of the new structure would be located away from the 17th Street property line, toward the southern portion of the site. Thus, the proposed overall heights would range from approximately 75 feet for the replacement transit facility to a maximum of up to 150 feet, inclusive of the approximately 75-foot-tall replacement transit facility. The proposed structure, including balconies, terraces, and other features, as well as any rooftop additions or elements that feature unbroken glazed segments, would be designed to be compliant with the bird-safe features described in San Francisco Planning Code (planning code) section 139, as applicable.

The proposed upper-floor setbacks above the replacement transit facility show residential structures set back approximately 70 feet from the north property line (17th Street), approximately 20 to 30 feet from the east property line (Hampshire Street), approximately 15 to 25 feet from the south property line (Mariposa Street), and approximately 10 to 30 feet from the west property line (Bryant Street).[50] (See **Figure 2.4: Proposed Massing – South (Mariposa Street) Elevation, Figure 2.5: Proposed Massing – West (Bryant Street) Elevation, Figure 2.6: Proposed Massing – North (17th Street) Elevation**, and **Figure 2.7: Proposed Massing – East (Hampshire Street) Elevation**.)

Visual simulations of the proposed project from various publicly accessible viewpoints along the perimeter of the project site are shown on **Figure 2.8: Proposed View Looking South from Franklin Square**; **Figure 2.9: Proposed View Looking North Along York Street**; **Figure 2.10: Proposed View Looking West Along Mariposa Street**; and **Figure 2.11: Proposed View Looking North from Bernal Heights**.

[49] SFMTA, Data Request Response, January 31, 2020, p. 2.
[50] Conceptual designs take advantage of the site's slope to limit shadows on Franklin Square.



Source: Sitelab Urban Studio, 2019

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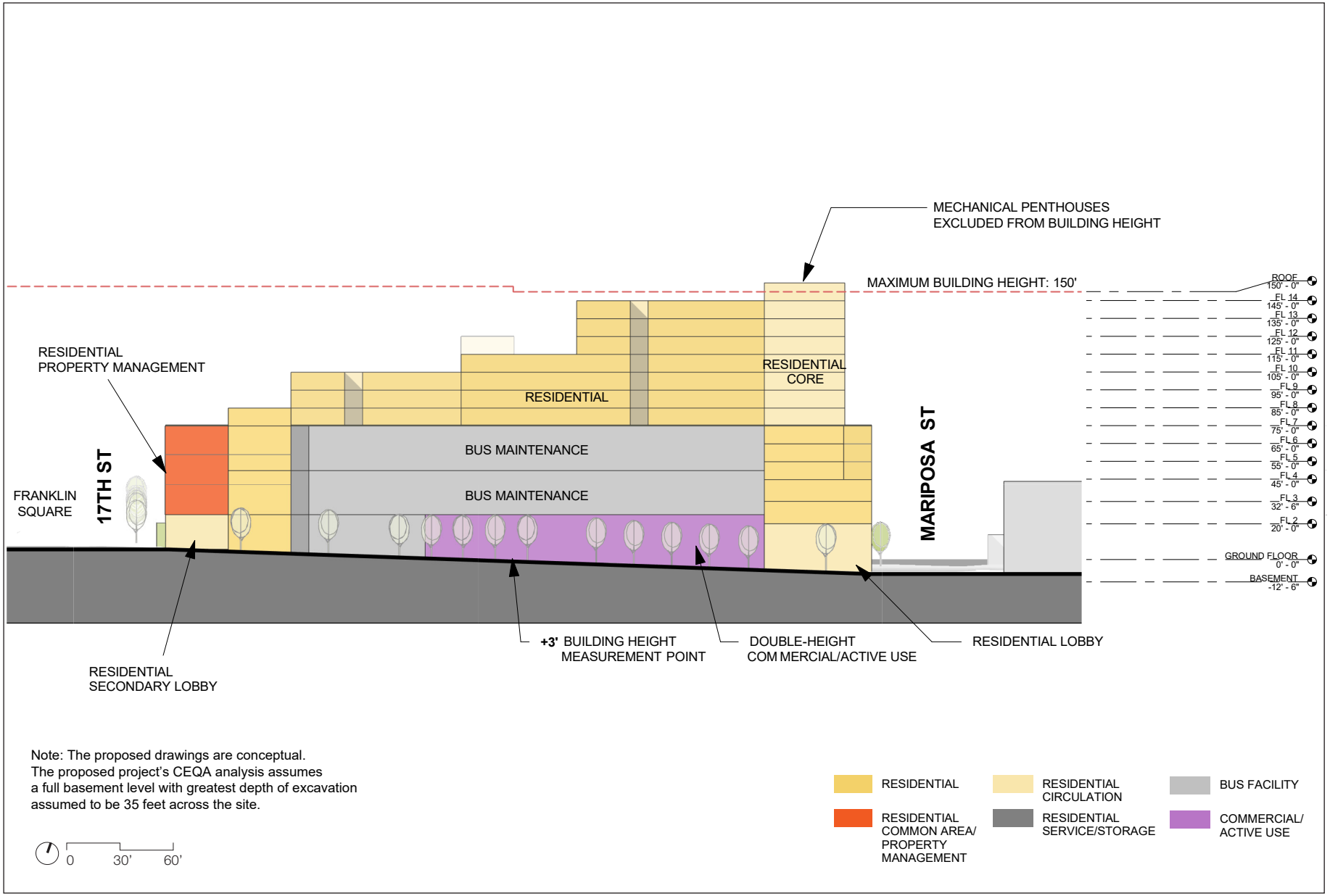
FIGURE 2.4: PROPOSED MASSING - SOUTH (MARIPOSA STREET) ELEVATION



Source: Sitelab Urban Studio, 2019

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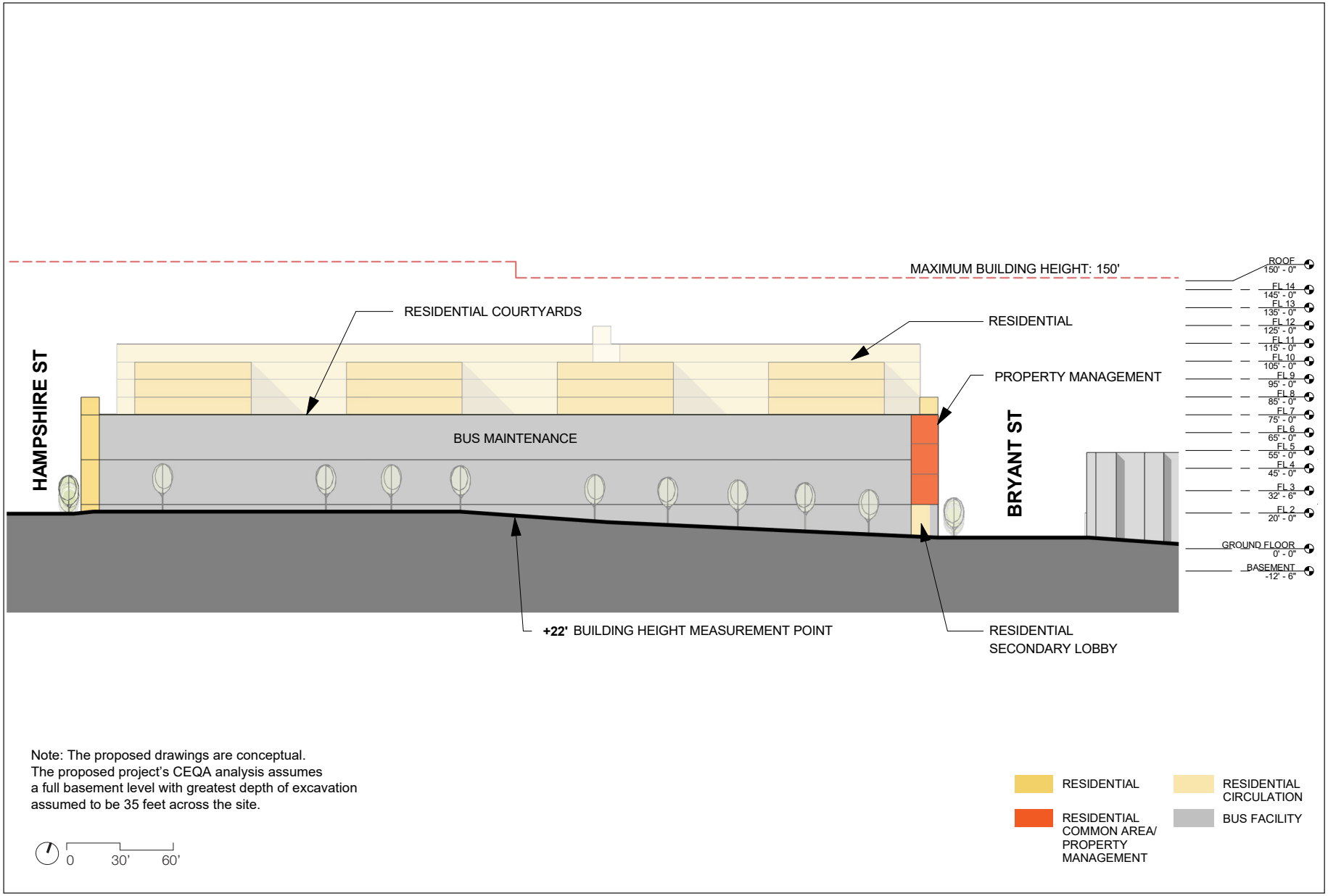
FIGURE 2.5: PROPOSED MASSING - WEST (BRYANT STREET) ELEVATION



Source: Sitelab Urban Studio, 2019

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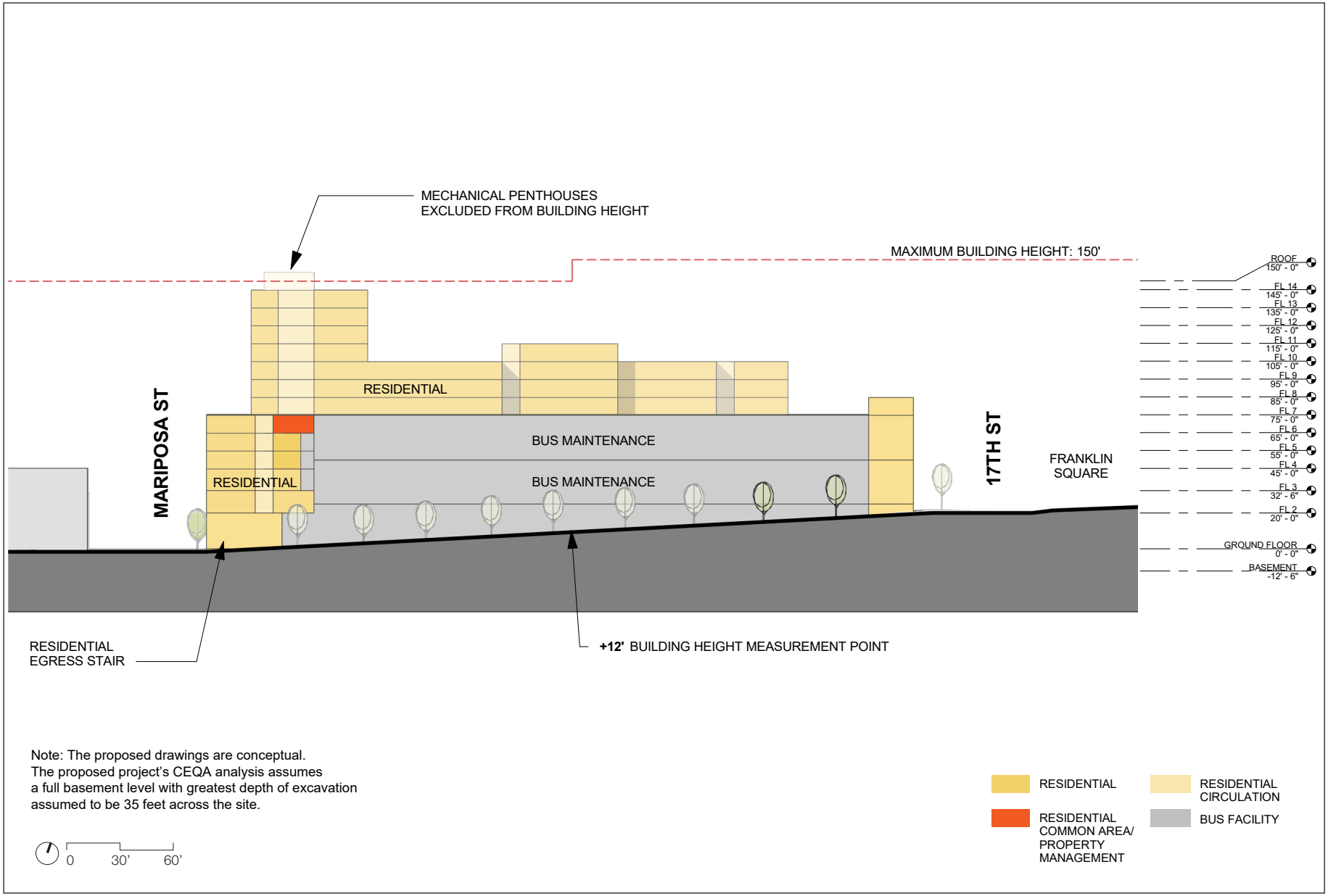
FIGURE 2.6: PROPOSED MASSING - NORTH (17TH STREET) ELEVATION



Source: Sitelab Urban Studio, 2019

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FIGURE 2.7: PROPOSED MASSING - EAST (HAMPSHIRE STREET) ELEVATION

Source: Prevision Design March 2020

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FIGURE 2.8: PROPOSED VIEW LOOKING SOUTH FROM FRANKLIN SQUARE

Source: Prevision Design March 2020

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FIGURE 2.9: PROPOSED VIEW LOOKING NORTH ALONG YORK STREET

Source: Prevision Design March 2020

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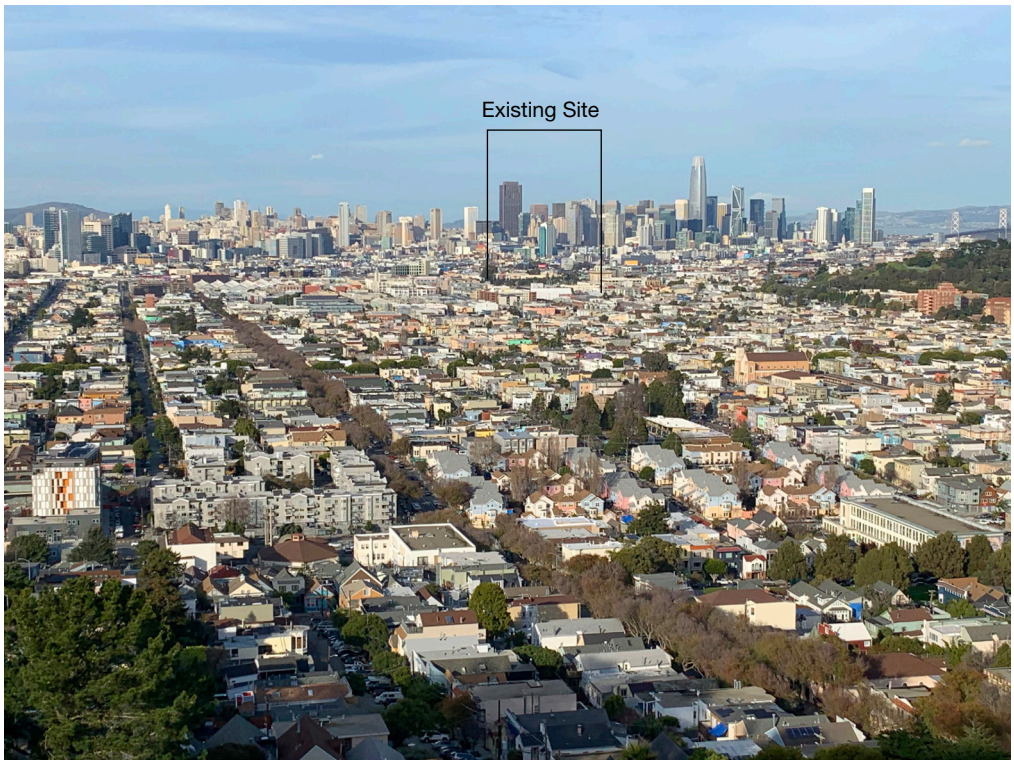
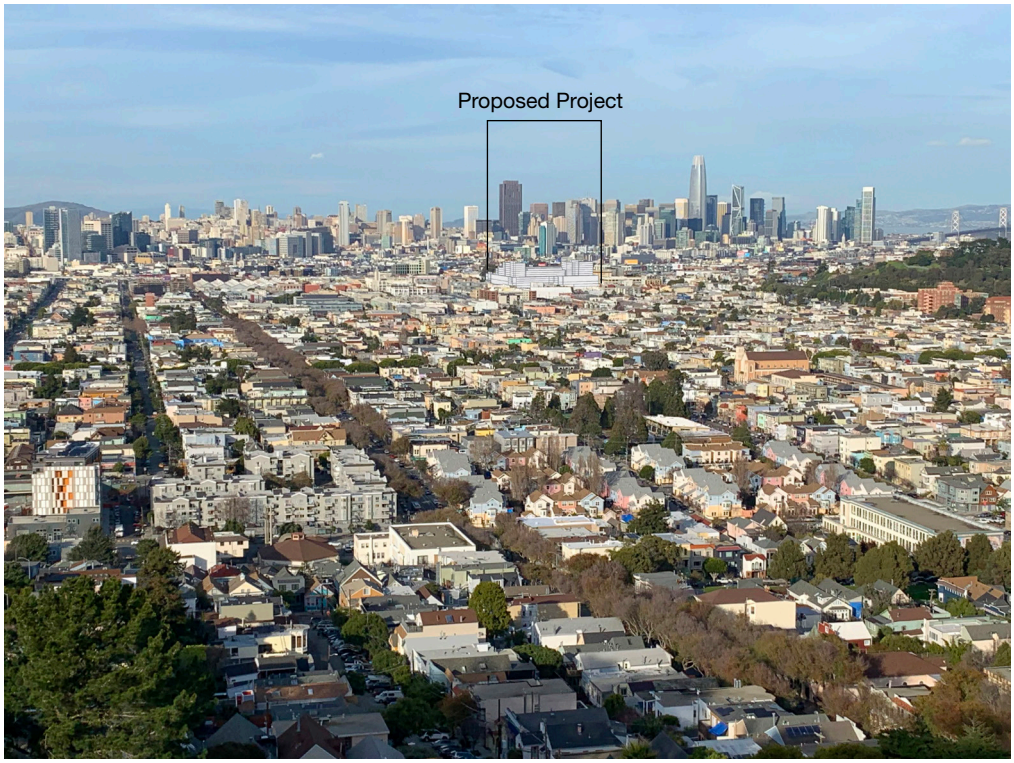
FIGURE 2.10: PROPOSED VIEW LOOKING WEST ALONG MARIPOSA STREET





Source: Prevision Design March 2020

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FIGURE 2.11: PROPOSED VIEW LOOKING NORTH FROM BERNAL HEIGHTS

The proposed uses are described below by level and floor and illustrated in **Figure 2.12** through **Figure 2.19**, on pp. 2.36-2.43.

PROPOSED BASEMENT LEVEL

The below-grade basement level would provide space for service functions for both the SFMTA and the joint development uses. The basement-level space for the SFMTA would include a loading dock, parts staging/storage area, battery electric storage, and work areas. Joint development space at the basement level would include a loading dock, storage, and service/delivery space. Other basement-level space would include stairways, elevators, separate class 1 bicycle parking facilities for the residential, commercial and SFMTA uses, and trash, recycling, and composting.[51] (See **Figure 2.12: Proposed Basement Level Plan**.) In addition to these uses at the basement level, the proposed project could occupy the site's full dimensions to accommodate additional battery electric storage and infrastructure space for future expansion.

PROPOSED TRANSIT LEVEL 1 (JOINT DEVELOPMENT FIRST FLOOR)

Transit Level 1 (or the ground level) would include heavy and running repair bays and would serve as a drive-through bus maintenance operation level. It would be below grade along 17th Street and at grade along Mariposa Street (see **Figure 2.13: Proposed Transit Level 1/Joint Development Floor 1**). The ground level would have stacked parking/storage for 40- and 60-foot-long buses, with a maximum capacity of 38 spaces for 40-foot-long buses (28 spaces if the buses are 60 feet long), and maintenance and support areas. Ramps and drive aisles would provide internal circulation.

Transit Level 1 may also provide support space and services for SFMTA transit operators, maintenance staff, and administrative staff, as well as space for storage and training.[52] Joint development space would be limited and may include ground-floor retail and residential lobbies.

PROPOSED MEZZANINE LEVEL (JOINT DEVELOPMENT SECOND FLOOR)

The mezzanine level would be developed along Mariposa and 17th streets (see **Figure 2.14: Proposed Mezzanine Level/Joint Development Floor 2**). The mezzanine level may include a bus

[51] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-101 (Basement Overall Plan) to A-101I (Basement - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 10, November 20, 2019.

[52] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-102 (1st Floor Overall Plan) to A-102I (1st Floor - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 11, November 20, 2019.

operations office and support areas, with some square footage assigned to joint development space.[53]

PROPOSED TRANSIT LEVEL 2 (JOINT DEVELOPMENT THIRD FLOOR)

Transit Level 2 would be at grade along 17th Street and would include ramps along the north property line (see **Figure 2.15: Proposed Transit Level 2/Joint Development Floor 3**). This level would provide drive aisles for circulation, stacked bus parking for 40- and 60-foot-long buses (90 spaces for 60-foot-long buses, 126 spaces if the buses are 40 feet long), a bus wash bay with a dedicated water reclamation equipment area, and electric charging infrastructure. A proposed emergency bus exit at the corner of 17th and Hampshire streets would provide access to 17th Street and replace the existing 52-foot-wide curb cut and driveway with a 42-foot-wide curb cut and driveway. Approximately 24 parking spaces and five electric vehicle charging stations would be dedicated for standard non-revenue vehicles. This level may also include SFMTA operations offices, conference rooms, training rooms, break rooms, restrooms, and lockers.[54] Joint development space may also be assigned on Transit Level 2.

PROPOSED TRANSIT LEVEL 3 (JOINT DEVELOPMENT FOURTH AND FIFTH FLOORS)

Transit Level 3 would provide drive aisles and stacked bus coach parking for 40- and 60-foot-long buses (85 spaces for 60-foot-long buses, 120 spaces if the buses are 40 feet long) with dedicated zones for electric charging infrastructure (see **Figure 2.16: Proposed Transit Level 3/Joint Development Floor 4**). Ramps between Transit Level 2 and Transit Level 3 are proposed along the north property line. Approximately 70 parking spaces and five electric vehicle charging stations would be dedicated for large and standard non-revenue vehicles. This level may also provide a bus wash bay with a dedicated water reclamation equipment area; a transit operations, equipment storage, and component rebuild assembly room; and associated storage, support, and supervisory areas.[55]

Transit Level 3 would also encompass the fourth and fifth joint development floors, with potential for residential units and circulation space along Mariposa Street (see **Figure 2.16** and **Figure 2.17: Proposed Joint Development Floor 5**).

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[53] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-103 (Training and Operations – 2nd Floor – Overall Plan) to A-103I (2nd Floor - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 12, November 20, 2019.

[54] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-104 (Bus Level 2 – 3rd Floor – Overall Plan) to A-104I (3rd Floor - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 13, November 20, 2019.

[55] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-105 (Bus Level 3 – 4th Floor – Overall Plan) to A-105I (4th Floor - Area I) and Sheets A-106 (5th Floor – Overall Plan) to A-106I (5th Floor – Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 14, November 20, 2019.

PROPOSED JOINT DEVELOPMENT SIXTH FLOOR

The sixth joint development floor would include residential units and circulation space and may include residential common areas/property management offices along the corners of Mariposa and Hampshire streets and Bryant and 17th streets (see **Figure 2.18: Proposed Joint Development Floor 6**).[56]

PROPOSED JOINT DEVELOPMENT FLOORS 7 TO 13

The joint development above the replacement transit facility would include residential units, residential service/storage areas, and circulation space (see **Figure 2.19: Proposed Joint Development Floors 7-13**). Residential structures would rise from three to seven stories above the replacement transit facility.[57] Up to 91,000 square feet of residential common open space could be developed on top of the replacement transit facility.

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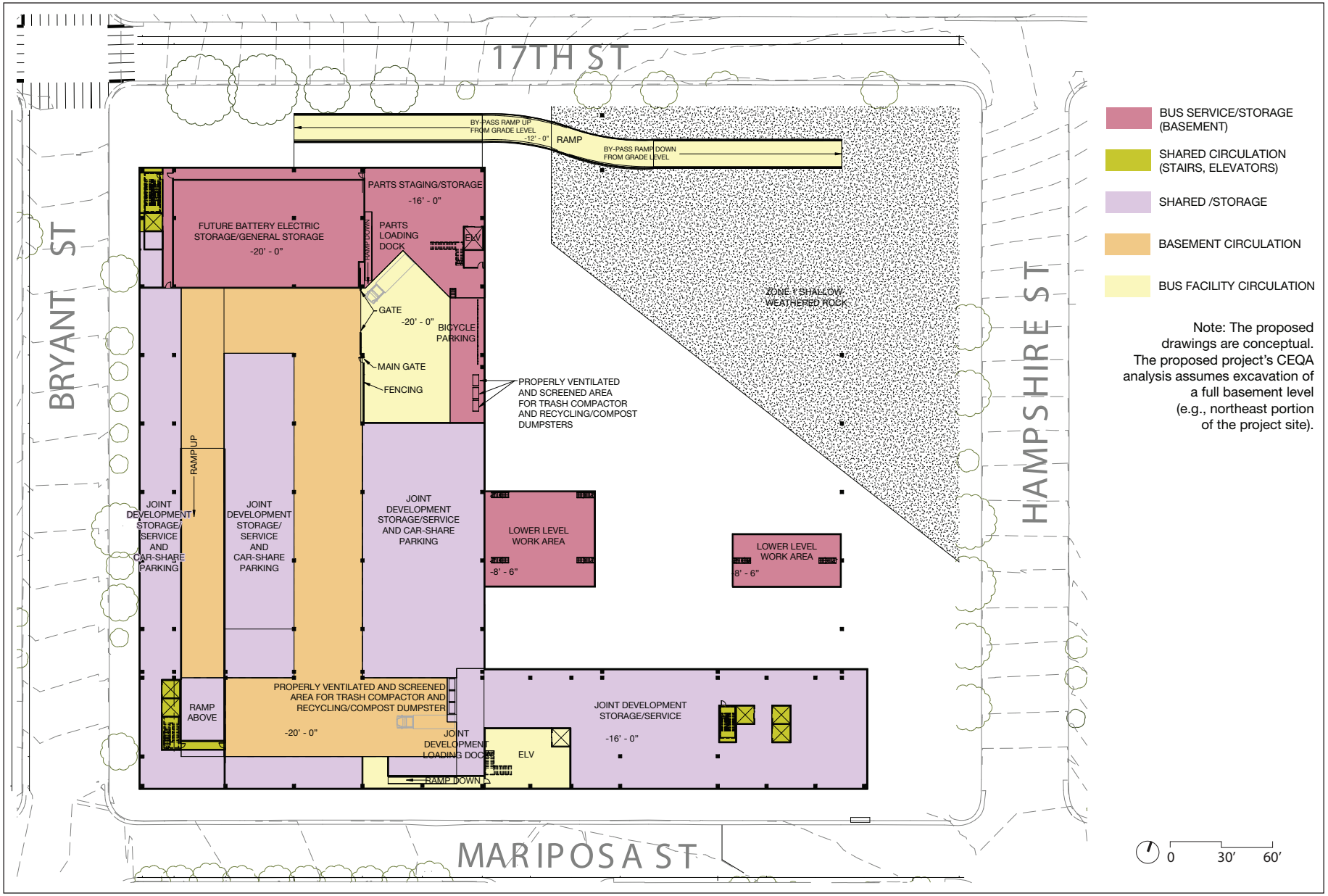
[56] Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 08, November 20, 2019.
[57] Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 09, November 20, 2019.



Source: HDR/Sitelab Urban Studio, 2019

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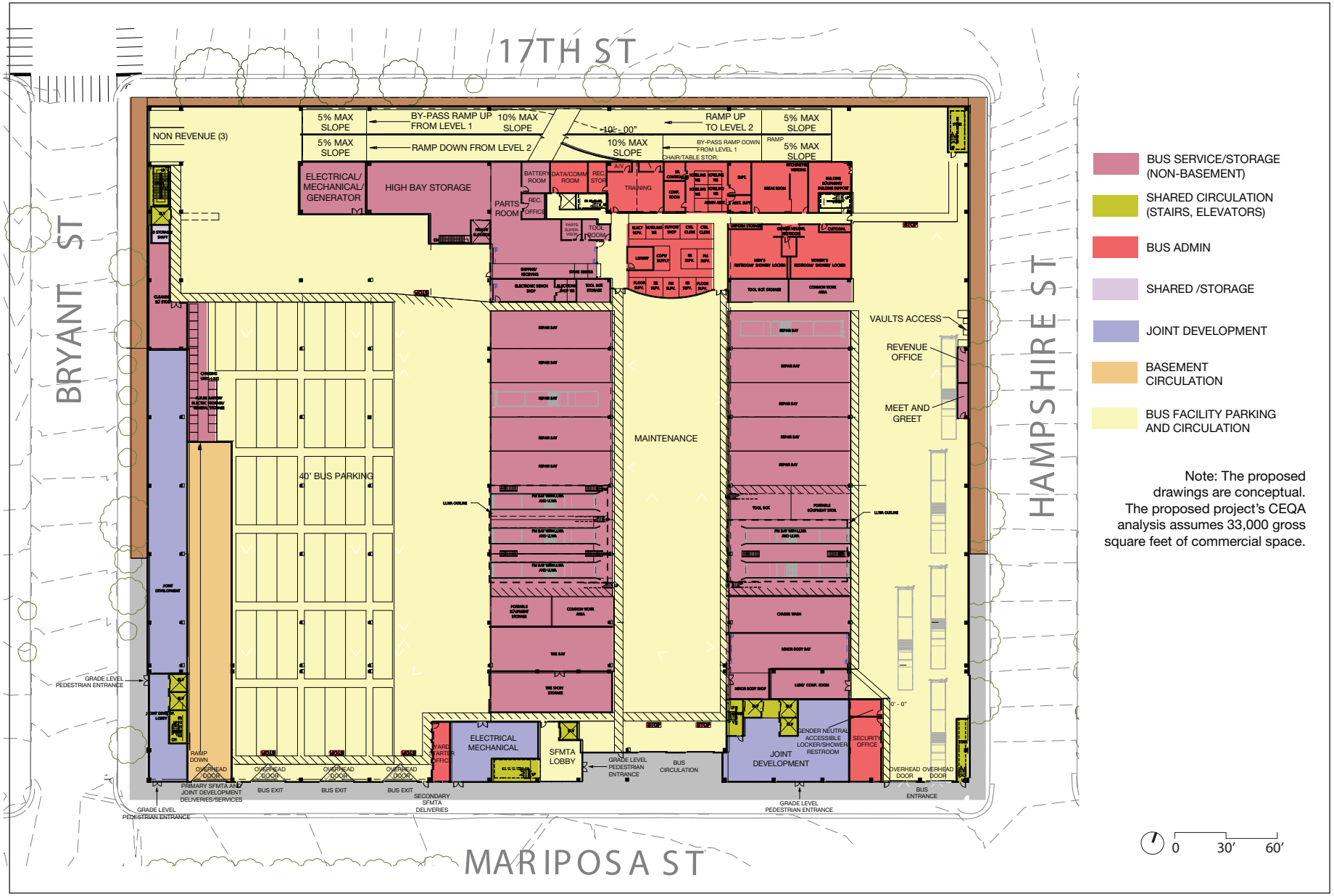
FIGURE 2.12: PROPOSED BASEMENT LEVEL



Source: HDR/Sitelab Urban Studio, 2019

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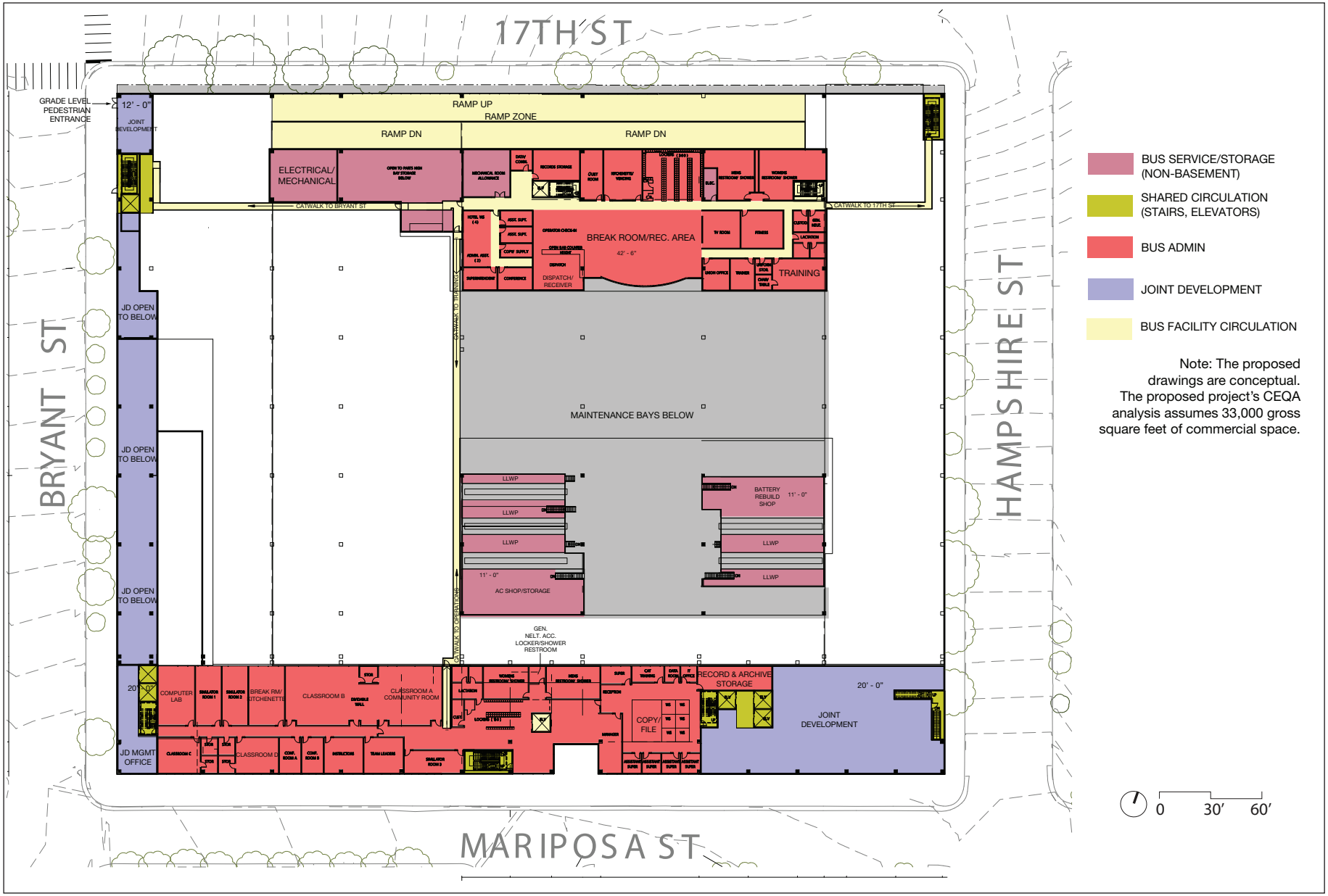
FIGURE 2.13: PROPOSED TRANSIT LEVEL 1/ JOINT DEVELOPMENT FLOOR 1



Source: HDR/Sitelab Urban Studio, 2019

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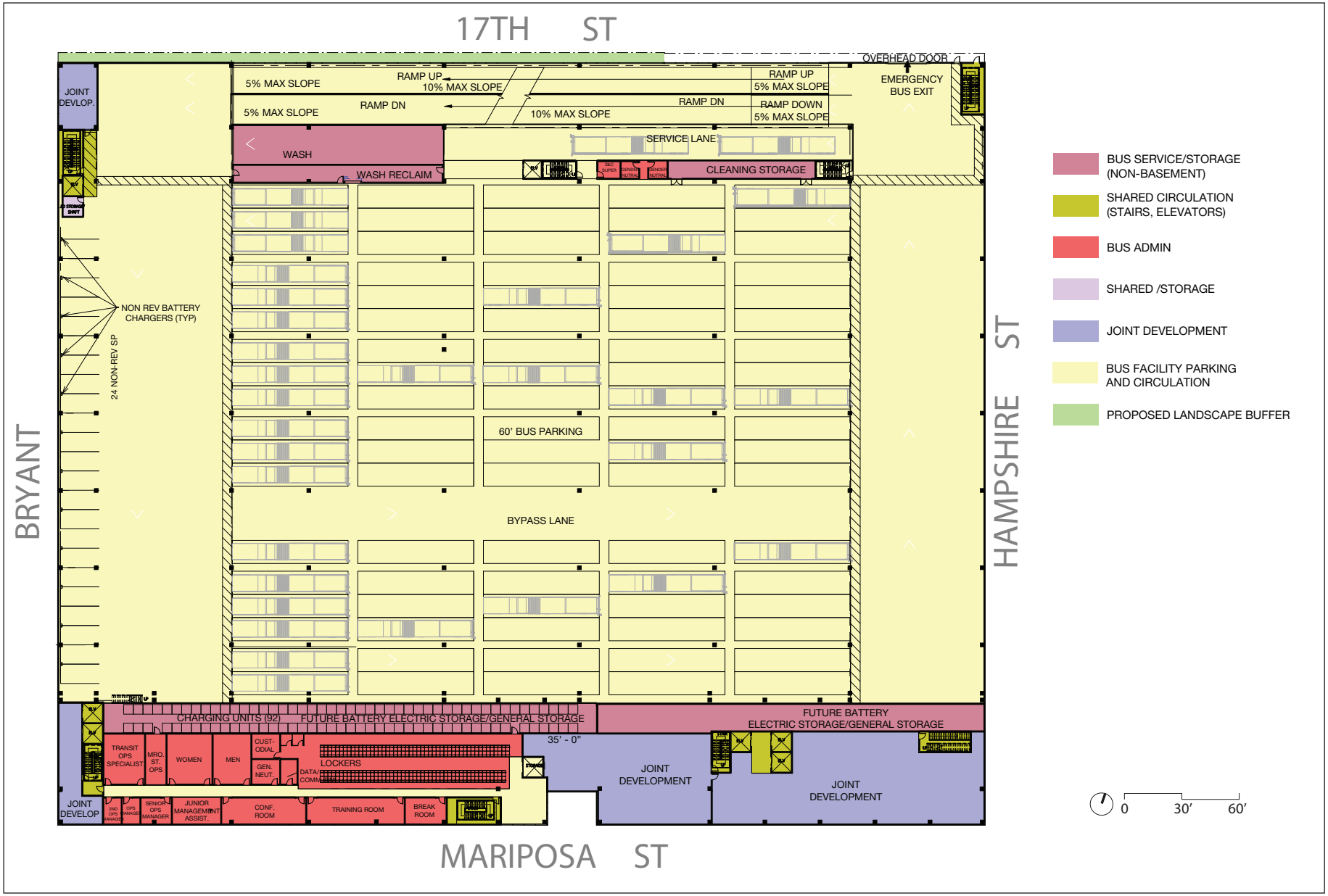
FIGURE 2.14: PROPOSED MEZZANINE LEVEL/ JOINT DEVELOPMENT FLOOR 2



Source: HDR/Sitelab Urban Studio, 2019

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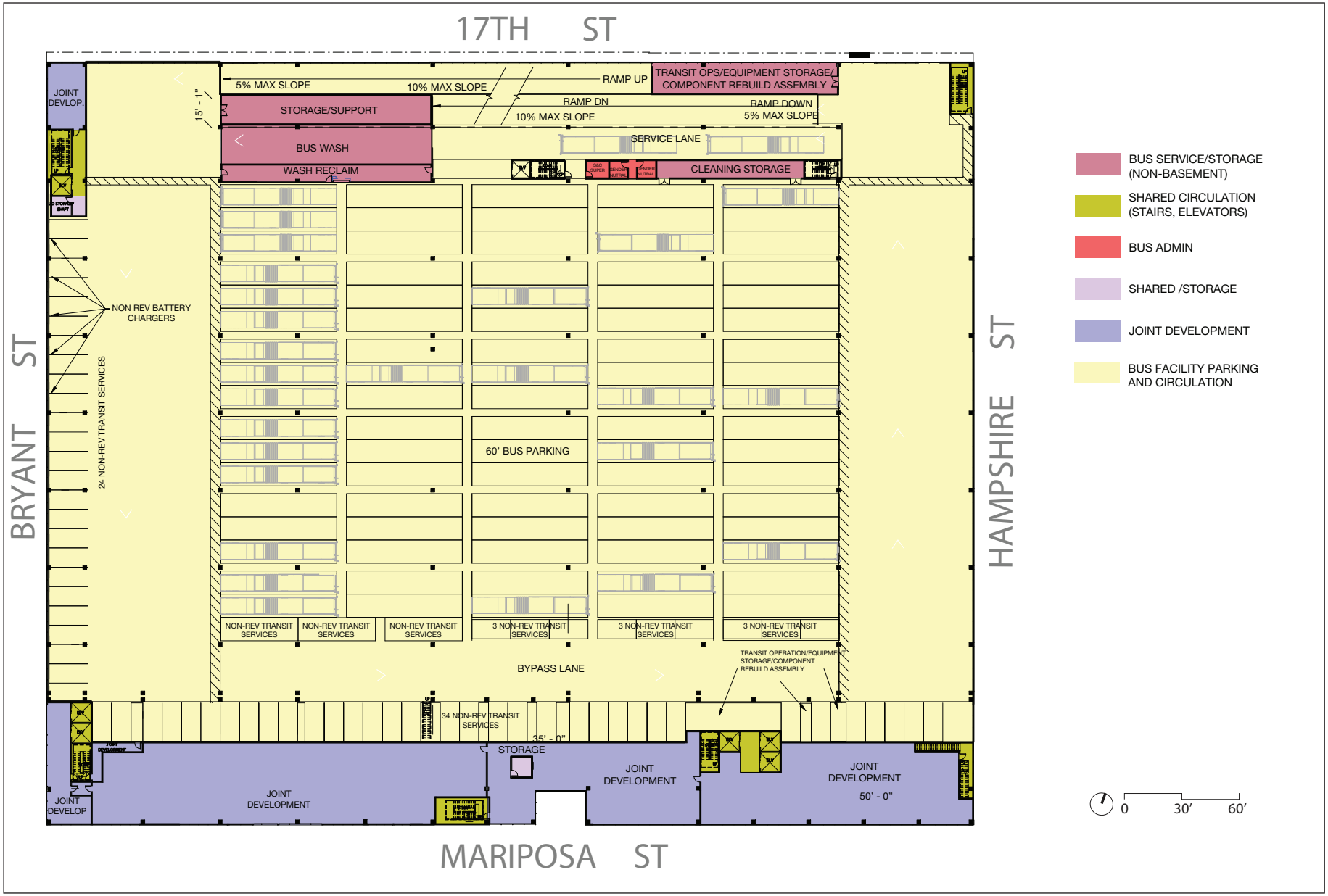
FIGURE 2.15: PROPOSED TRANSIT LEVEL 2/ JOINT DEVELOPMENT FLOOR 3



Source: HDR/Sitelab Urban Studio, 2019

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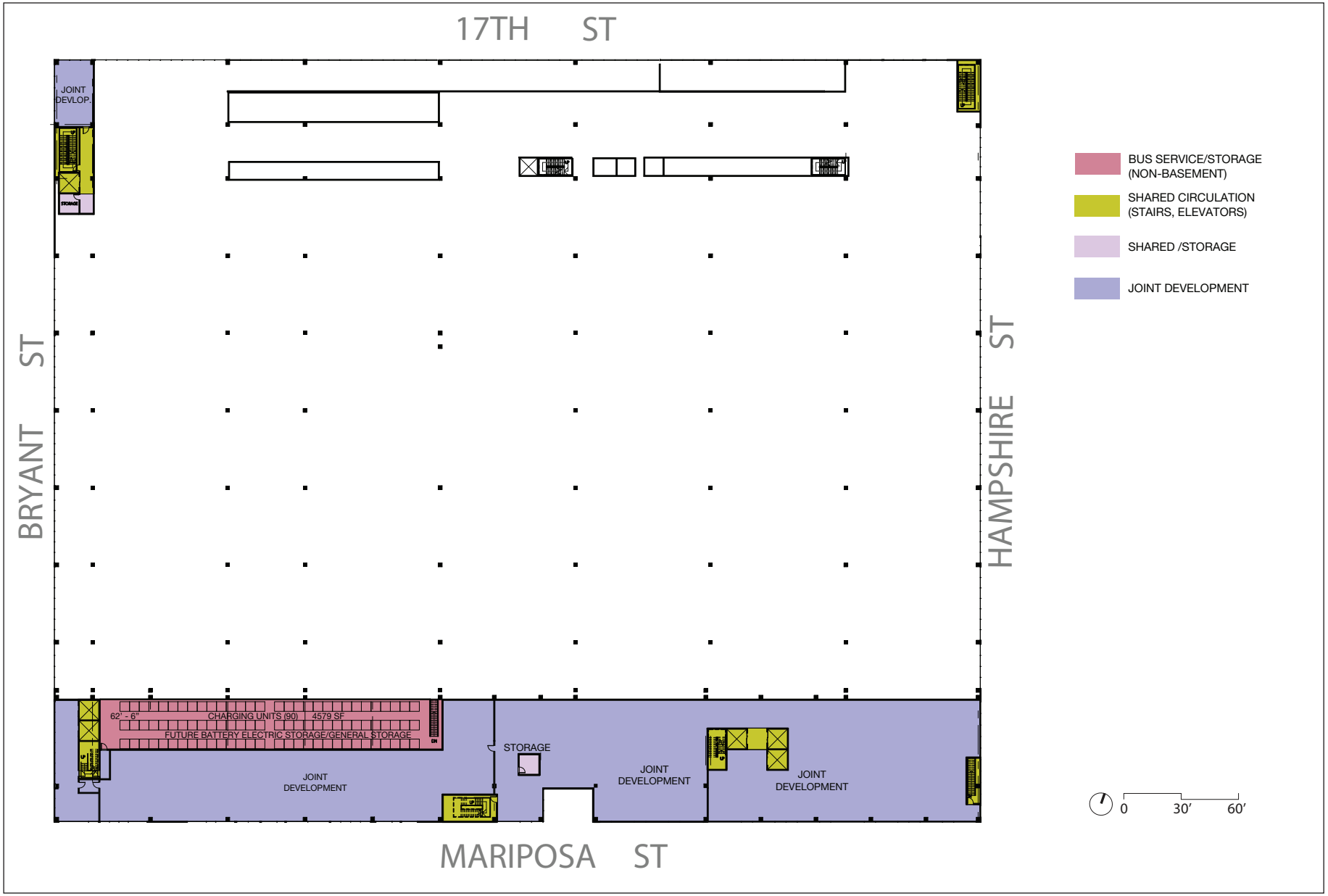
FIGURE 2.16: PROPOSED TRANSIT LEVEL 3/ JOINT DEVELOPMENT FLOOR 4



Source: HDR/Sitelab Urban Studio, 2019

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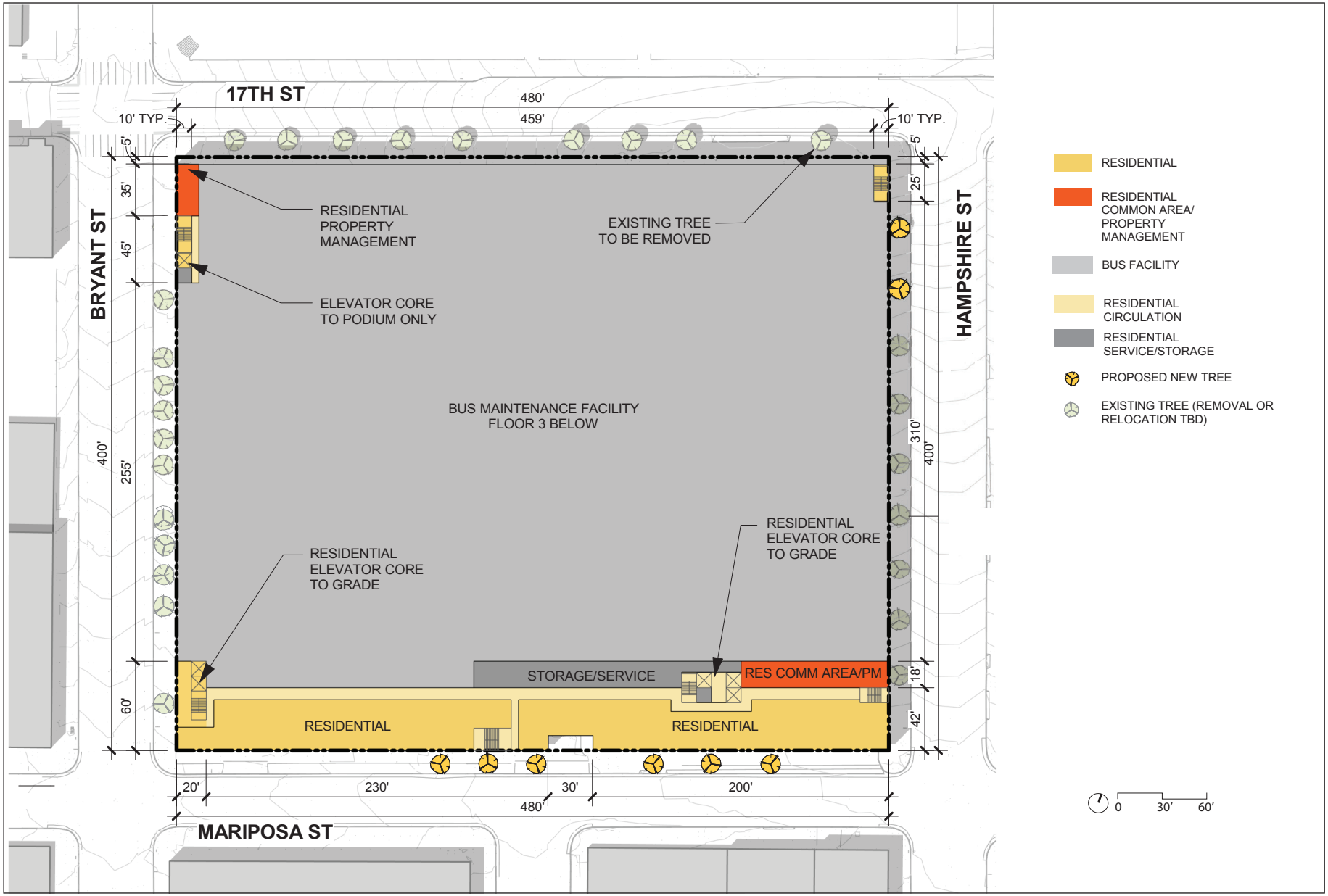
FIGURE 2.17: PROPOSED JOINT DEVELOPMENT FLOOR 5



Source: Sitelab Urban Studio, 2019

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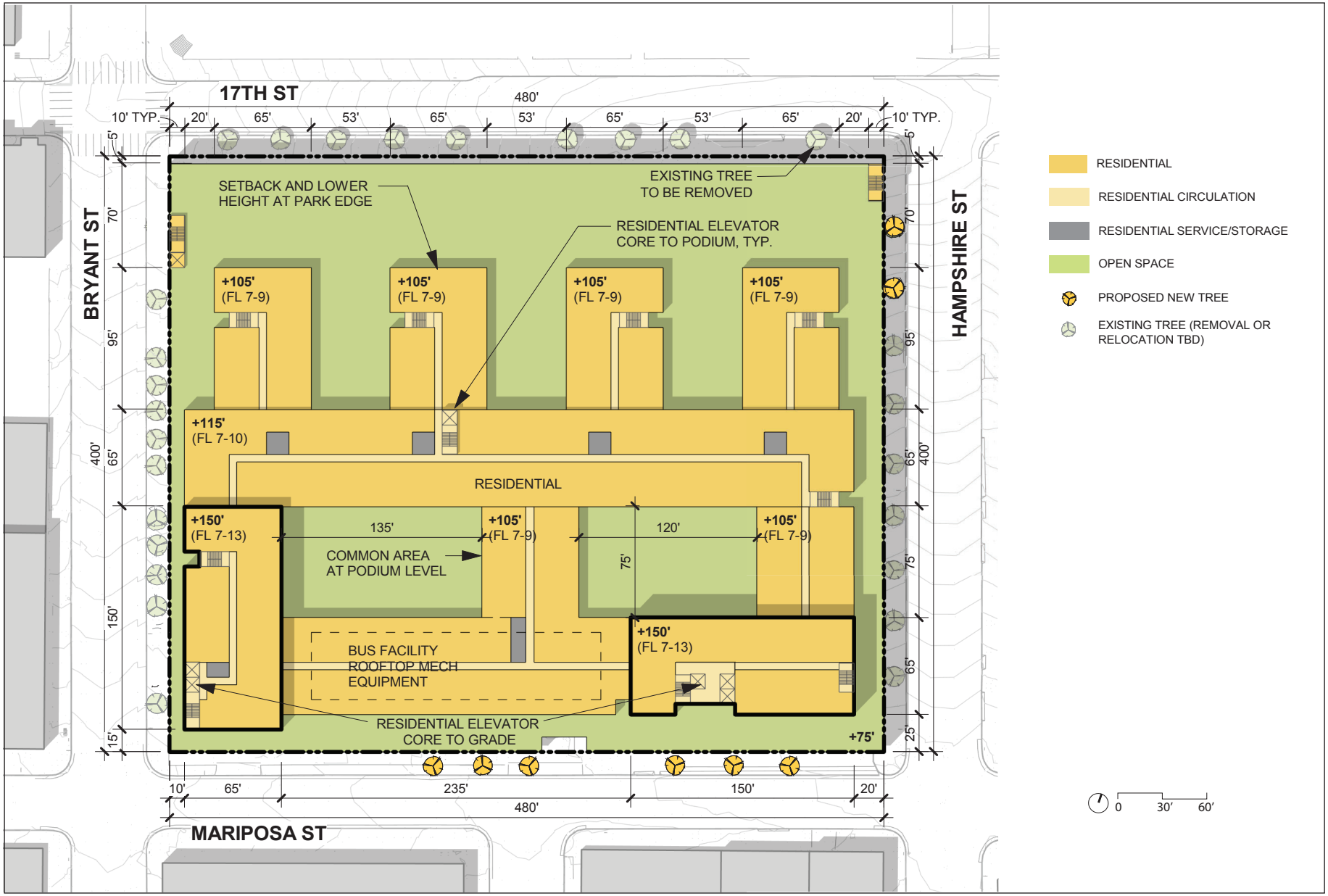
FIGURE 2.18: PROPOSED JOINT DEVELOPMENT FLOOR 6



Source: Sitelab Urban Studio, 2019

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FIGURE 2.19: PROPOSED JOINT DEVELOPMENT FLOORS 7-13

PROPOSED CHANGES IN STREET RIGHTS-OF-WAY

The proposed project includes changes within the Mariposa Street, 17th Street, Bryant Street, and Hampshire Street rights-of-way (see **Figure 2.3**, p. 2.20). To the extent feasible, all proposed changes would conform to the guidelines in the Better Streets Plan and the Mission District Streetscape Plan,[58] as well as the requirements of the SFMTA, the San Francisco Public Utilities Commission, and the Bureau of Urban Forestry. Many of these changes would require further engineering, public input, and review to confirm feasibility and desirability.

The project proposes to retain existing mature street trees along 17th and Hampshire streets, plant new street trees, install street lighting, install pedestrian bulbouts and pedestrian ramps, attach overhead catenary system cables to the proposed building, and remove catenary poles from the sidewalk. The proposed project would also move overhead utilities underground if and where it is feasible. Details of the proposed changes to the pedestrian network, bicycle network, bus stops, and parking and loading are discussed below.

PEDESTRIAN NETWORK

The existing bus storage yard (south fence) encroaches on the Mariposa Street sidewalk, narrowing the existing sidewalk width along the western half of the Mariposa site frontage to 7 feet. The footprint of the replacement transit facility would be moved back to the property line, which would enable the project to effectively widen the Mariposa Street sidewalk to 15 feet as recommended in the Better Streets Plan. The proposed project would maintain all other sidewalks at 15 feet wide.

The proposed project would also construct the following pedestrian network improvements, including all necessary striping and lighting, pending further feasibility analysis:

- bulbouts at the northeast corner of Bryant and Mariposa streets projecting into both Bryant and Mariposa streets southwest of the project site
- bulbout at the northwest corner of Hampshire and Mariposa streets projecting into Hampshire Street southeast of the project site
- curb ramps for pedestrian crossings adjacent to the project site and a curb ramp on the southeastern side of the Mariposa/York street intersection facing Mariposa Street
- continental-style crosswalks at all approaches at the intersections of Hampshire/17th streets, Hampshire/Mariposa streets, and Mariposa/York streets
- a raised crosswalk and a rectangular rapid flash beacon for the pedestrian crossing of 17th Street at Hampshire Street

[58] San Francisco Planning Department, Mission District Streetscape Plan, available at *https://archives.sfplanning.org/CDG/CDG_mission_streetscape.htm*, accessed March 30, 2021.

BICYCLE NETWORK

The project would convert the existing striped and partially protected bicycle lanes into green protected, widened bikeways in both directions on the segment of 17th Street between Bryant and Hampshire streets. This change would require the elimination of parallel parking on the north side of 17th Street. If this is not feasible, the SFMTA would upgrade the existing class IV cycle track on the south side of 17th Street near Bryant Street by raising the bike lane to sidewalk level, applying green paint, and installing "safe hit posts," thereby improving portions of the existing class IV bicycle facility.

BUS STOPS

The proposed project would not change existing bus operations in the vicinity of the project site, i.e., remove or relocate bus stops. The northbound and southbound Muni bus stops for the 27 Bryant route on the southeast (adjacent to the project site) and southwest corners of Bryant and 17th streets would remain. The existing northbound and southbound Muni bus stops on the southeast and northwest corners of Bryant and Mariposa streets, respectively, would potentially include new shelters, transit notification systems, and additional street lighting, as necessary.

PARKING AND LOADING

The proposed project would maintain perpendicular on-street parking on the west side of Hampshire Street adjacent to the project site but would eliminate several spaces to accommodate a pedestrian bulbout and accompanying passenger loading zone at Hampshire Street immediately north of Mariposa Street. Parking on the east side of Hampshire Street (across from the project site) would be converted to parallel parking, eliminating several spaces. Parking would also be eliminated and prohibited on the east and west sides of Hampshire Street within 10 feet of the intersection of 17th and Hampshire streets. Other changes include the following:

- eliminating parallel parking on the north side of 17th Street between Bryant and Hampshire streets starting approximately 230 feet east of the intersection of Bryant and 17th streets to gain more width for protected bike lanes
- removing parking spaces along the north side of Mariposa Street and restriping as a no parking zone
- installing audible and/or visual warning systems to alert pedestrians and/or bicyclists as buses, non-revenue vehicles, and other SFMTA vehicles exit onto Mariposa and 17th streets

The primary off-street loading areas for the SFMTA and for the proposed residential use would be located in the proposed basement level, accessed via a 20-foot-wide ramp on Mariposa Street east of Bryant Street. A secondary off-street loading area for the SFMTA would be located on the ground floor. In addition, limited curb areas would be restriped for on-street passenger and commercial loading, with two accessible 60-foot-long passenger loading zones proposed along

Bryant and Hampshire streets, immediately north of Mariposa Street; and a 40-foot-long commercial loading zone proposed along Bryant Street, immediately north of the proposed passenger loading zone (see **Figure 2.3**, p. 2.20).

ACCESS AND SITE CIRCULATION

Primary vehicular access to and from the site would be from Mariposa Street, as follows (see **Figure 2.3**, p. 2.20):

- The four bus entry bays between York and Hampshire streets would be accessed via two separate curb cuts, an approximately 47-foot-wide curb cut near Hampshire Street and an approximately 63-foot-wide curb cut near York Street.
- The three bus exit bays between Bryant and York streets would be exited via an approximately 97-foot-wide curb cut.
- The existing 30-foot-wide curb cut on Mariposa Street (near Bryant Street) would be reduced to an approximately 20-foot-wide curb cut that would accommodate loading and delivery and other joint development and transit facility space needs.

The existing 52-foot-wide curb cut and driveway on 17th Street would be relocated east closer to Hampshire Street and reduced in width to 42 feet. It would function as an emergency exit for buses and non-revenue vehicles.

Work bays on Transit Level 1 would be accessed via drive aisles associated with the two westernmost entry bays from Mariposa Street. Buses and non-revenue vehicles would use the ramps at the north side of the building to access work bays and parking spaces on Transit Levels 2 and 3 as well as parking spaces on Transit Level 1 via an at-grade level bypass ramp (see **Figure 2.12: Proposed Basement Level** and **Figure 2.13: Proposed Transit Level 1/Joint Development Floor 1**, pp. 2.36 and 2.37). The ramps and drive aisles would route all buses and non-revenue vehicles south toward the Mariposa Street exits.

The proposed basement level would accommodate building services and battery electric infrastructure for the SFMTA and the joint development components providing tenant storage; dumpsters for refuse, recycling, and compost; parking for bicycles (class 1) and car-share vehicles (12); and two loading docks. Internal circulation on this level would accommodate service delivery vehicles for the proposed transit, residential, and commercial uses, as well as refuse collection trucks.

SFMTA staff would access the replacement transit facility through a ground-floor lobby on Mariposa Street. The residential component of the proposed project along the southern and western perimeter of the replacement transit facility, as well as the residential development atop the replacement transit facility, would be accessed through ground-floor lobbies, shown on Mariposa and Bryant streets (see **Figure 2.13** and **Figure 2.14: Proposed Mezzanine Level/Joint**

Development Floor 2, pp. 2.37 and 2.38). Shared elevators and stairs would be located at the northwest, southwest, and southeast corners of the proposed building.[59]

PROPOSED LANDSCAPING AND OPEN SPACE

LANDSCAPING

The proposed project would include a 5-foot-wide planting strip along the length of the 17th Street frontage (up to 2,140 square feet). No additional at-grade landscaping is proposed as part of the project; however, common open space serving the residents (and possibly SFMTA employees) could be developed on top of the replacement transit facility.

Construction of the proposed project would require the removal, retention, and/or replacement of the 27 existing street trees along 17th, Bryant, and Hampshire streets. The project sponsor team would plant new street trees on the adjacent sidewalks, including new trees to replace any removed, in compliance with the planning code, the San Francisco Public Works Code (public works code), and the Better Streets Plan.[60] Specific streetscape changes related to retaining and planting street trees would include the following:

- On 17th Street, the existing mature trees would be retained, except for those that would conflict with the proposed location for the emergency bus exit, and new street trees would be planted.
- On Bryant and Hampshire streets, trees located in the middle of the sidewalk may be replaced with new street trees.
- On Mariposa Street, approximately six trees would be planted in locations that would not conflict with bus driveways.

OPEN SPACE

Common and private open space is proposed for the residential uses in accordance with the requirements set forth in section 135 of the planning code. Up to 91,000 square feet of common open space is proposed as part of the project. During review of the proposed project's detailed design, the SFMTA would determine the feasibility of designating onsite open space for SFMTA staff and/or public use. The overall final design and allocation of common open space for the proposed project may be modified throughout the planning entitlement process.

PROPOSED STORMWATER MANAGEMENT

The project site is served by the San Francisco Public Utilities Commission's combined sewer system, and the entire site is covered with impervious surfaces. Implementation of the proposed

[59] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheet A-102 (1st Floor Overall Plan), June 14, 2019.
[60] See planning code sections 138.1 and 428 and public works code sections 805(a) and 806(d) for specific requirements related to tree planting and allowable waivers due to site constraints.

project would disturb more than 5,000 square feet of impervious ground surface. Thus, the City's Stormwater Management Requirements and Design Guidelines are applicable, requiring Preliminary and Final Stormwater Control Plans to be submitted to the San Francisco Public Utilities Commission for review.[61] The proposed project would cover the entire lot (except for a 5-foot-wide landscaping strip along 17th Street) and would incorporate best management practices to ensure proper onsite retention and management of stormwater to meet the requirements of the stormwater management ordinance. The project's detailed final design will address these requirements and incorporate measures to reduce the stormwater runoff rate and volume, such as site-wide stormwater retention and rainwater capture and treatment systems, to provide a non-potable water supply for the replacement transit facility's bus wash bays, toilet and urinal flushing, and landscaping.

PROPOSED SUSTAINABILITY PROGRAM

It is anticipated that the proposed building (including the transit facility and joint development components) would be designed to meet United States Green Building Council and LEED requirements. The proposed sustainability strategies would comply with state, regional, and local green building requirements as set forth in the California Green Building Standards Code, the San Francisco Green Building Code, and chapter 7 of the environment code to obtain LEED Gold certification. The sustainable design building systems could include, but would not be limited to, development of electrical infrastructure capable of supplying electricity for electric vehicle charging of the fleet, and other strategies or mechanisms, such as daylight harvesting through the use of a network of occupancy and vacancy sensors;[62] the use of solar photovoltaic panels on rooftops to produce onsite power; green roofs to minimize heat island effects;[63] and the use of Title 24-compliant components for plumbing and other building systems such as heating, ventilation, and air conditioning.[64]

PROJECT CONSTRUCTION

The general approach to construction of the proposed project would be shaped by the construction operations and applicable safety regulations, such as the California Manual on Uniform Traffic

[61] San Francisco Public Utilities Commission, *https://sfwater.org/index.aspx?page=1006*, accessed March 30, 2021.

[62] A building control system that reduces demand for artificial light in building interiors when daylight is available thus reducing energy demand.

[63] The combined effect of heat generated from use of mechanical equipment and heat trapping/reflectivity characteristics of impermeable surfaces on rooftops and other land, such as paved roadways and parking lots, that increases ambient temperatures in urbanized areas and increases energy demand for building cooling.

[64] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: 3-Level Bus Facility Design Criteria Document, June 2019, Section 4.4 (Sustainability), Section 4.12 (Electrical), Section 5.3 (Exterior Enclosure), Section 5.8 (Plumbing), and Section 5.10 (HVAC), pp. 36-38, 46, 48-50, 71, 84, 88, 95, and 103-104.

Control Devices and the City's Regulations for Working in San Francisco Streets, eighth edition (also known as the "Blue Book") and applicable public works orders such as public works order 200369 related to standard paving materials in the public rights-of-way.[65] Traffic, transit, pedestrian, and bicycle flow around a construction zone would be guided by the California Manual on Uniform Traffic Control Devices and the Blue Book, as dictated by the general contractor, with concurrence and approval by the City traffic engineer. Traffic speeds would likely be reduced adjacent to a construction zone and loading spaces would be relocated away from active construction zones.

Construction protocols outlined in the Blue Book and public works orders include the following key topics:

- General job site safety and housekeeping by contractors
- Safe path of travel for all modes
- Parking and commercial/passenger loading restrictions (permitted/non-permitted)
- Dust controls
- Construction staging and storage of materials and equipment
- Night noise permits, noise levels (day and night)
- General traffic and transit flow
- Holiday moratoria

If the project is approved, the project sponsor team would prepare construction-level plans and documents, which would include a detailed approach to project construction logistics. Project construction would follow a typical phased approach, as discussed below under "Construction Duration." The construction plan would address issues related to circulation (transit, vehicle, pedestrian, and bicyclist), safety, construction staging, parking, and other activities in the area during the construction period and include detailed traffic control and detour plans.

Additionally, all construction contracts for the proposed project require the inclusion of public works' Standard Construction Measures (SCMs) in bid packages for the purposes of protecting human health and safety as well as environmental resources. The SCMs incorporated as part of the proposed project, as shown in **Table 2.3: San Francisco Public Works Standard Construction Measures**, are related to the following environmental resource areas or related topics: seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (construction staging), and cultural resources (archeological resources and historic architectural resources).

[65] San Francisco Public Works, Public Works Orders, *https://sfpublicworks.org/services/permits/public-works-orders*, accessed April 5, 2021.

Table 2.3: San Francisco Public Works Standard Construction Measures

Public Works' Standard Construction Measure #1, Seismic and Geotechnical Studies The project manager shall ensure that projects that may potentially be affected by existing soil, slope and/or geologic conditions at the project site will be screened for liquefaction, subsidence, landslide, fault displacement, and other geological hazards at the project site, and will be engineered and designed as necessary to minimize risks to safety and reliability due to such hazards. As necessary, geotechnical investigations will be performed.
Public Works' Standard Construction Measure #2, Air Quality All projects will comply with the Construction Dust Control Ordinance (see Attachment A **[Public Works' Standard Construction Measures for Public Works Projects, June 26, 2017]**). Major construction projects that are estimated to require 20 or more days of cumulative work within the Air Pollutant Exposure Zone must comply with the additional clean construction requirements of the Clean Construction Ordinance (see Attachment B **[Public Works Standard Construction Measures for Public Works Projects, June 26, 2017]**).
Public Works' Standard Construction Measure #3, Water Quality All projects will implement erosion and sedimentation controls to be tailored to the project site, such as fiber rolls and/or gravel bags around stormdrain inlets, installation of silt fences, and other such measures sufficient-to prevent discharges of sediment and other pollutants to storm drains and all surface waterways, such as San Francisco Bay, the Pacific Ocean, water supply reservoirs, wetlands, swales, and streams. As required based on project location and size, a Stormwater Control Plan (in most areas of San Francisco) or a Stormwater Pollution Prevention Plan (SWPPP) (in certain areas of San Francisco) will be prepared. If uncontaminated groundwater is encountered during excavation activities, it will be discharged in compliance with applicable water quality standards and discharge permit requirements. Groundwater contamination is addressed in item 6 below.
Public Works' Standard Construction Measure #4, Traffic All projects will implement traffic control measures sufficient to maintain traffic and pedestrian circulation on streets affected by construction of the project. The measures will also, at a minimum, be consistent with the requirements of San Francisco Municipal Transportation Agency (SFMTA)'s Blue Book. Traffic control measures may include, but not be limited to, flaggers and/or construction warning sign age of work ahead; scheduling truck trips during non-peak hours to the extent feasible; maintaining access to driveways, private roads, and off-street commercial loading facilities by using steel trench plates or other such method; and coordination with local emergency responders to maintain emergency access. Any temporary rerouting of transit vehicles or relocation of transit facilities would be coordinated with SFMTA Muni Operations.
Public Works' Standard Construction Measure #5, Noise All projects will comply with local noise ordinances regulating construction noise. Public Works shall undertake measures to minimize noise disruption to nearby neighbors and sensitive receptors during construction. These efforts could include using best available noise control technologies on equipment (i.e., mufflers, ducts, and acoustically attenuating shields), locating stationary noise sources (i.e., pumps and generators) away from sensitive receptors, erecting temporary noise barriers, and other such measures. During nighttime construction activities, the following shall apply: impact tools and vibratory pile drivers shall have intake exhaust mufflers and/or acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works; the construction contractor shall avoid using water blasters; arid the use of vehicles that are legally required to be equipped with backing warning alarms will be reduced to the extent feasible; and administrative controls as defined in the California Code of Regulations, Title 8 Sec. 1592 will be used for worker protection for backing movements by other vehicles. Hours of vibration-intensive activities, such as vibratory pile driving, shall be restricted to between 7:00 a.m. and 8:00 p.m.

Public Works' Standard Construction Measure #6, Hazardous Materials

Projects that involve excavation of 50 cubic yards of soil in the Maher Z will comply with the Maher Ordinance (see Attachment C **[Public Works' Standard Construction Measures for Public Works Projects, June 26, 2017]**. Projects on sites that are not currently located in the Maher Zone but have the potential to contain hazardous materials in soil and/or groundwater will be referred to the Department of Public Health as newly identified Maher sites.

Public Works' Standard Construction Measure #7, Biological Resources

Projects will comply with all local, State, and federal requirements for surveys, analysis, and protection of biological resources (e.g., Migratory Bird Treaty Act, Federal and State Endangered Species Acts, etc.). All project sites and the immediately surrounding area will be screened to determine whether biological resources may be affected by construction. If biological resources are present, a qualified biologist will carry out a survey of the project site to note the presence of general biological resources and to identify whether habitat for special-status species and/or migratory birds is present. If necessary, measures will be implemented to protect biological resources, such as installing wildlife exclusion fencing, establishing work buffer zones, installing bird deterrents, monitoring by a qualified biologist and other such measures. If, tree removal is required, Public Works will comply with any applicable tree protection ordinance.

Public Works' Standard Construction Measure #8, Visual and Aesthetic Considerations, Project Site

All project sites will be maintained in a clean and orderly state. Construction staging areas will be sited away from public view, and on currently paved or previously disturbed areas, where possible. Nighttime lighting will be directed away from residential areas and have shields to prevent light spillover effects. Upon project completion, project sites on City-owned lands will be returned to their general pre-project condition, including re-grading of the site and re-vegetation or re-paving of disturbed areas to the extent this is consistent with Public Works Bureau of Urban Forestry Policy and San Francisco Code. Project sites on non-City land will be restored to their general pre-project condition so that the owner may return them to their prior use, unless otherwise arranged with the property owner.

Public Works' Standard Construction Measure #9, Cultural Resources

All projects that will alter a building or structure, produce vibrations, or include soil disturbance[1] will be screened to assess whether cultural resources are or may be present and could be affected, as detailed below.

Archeological Resources. No archeological review is required for a project that will not entail soil disturbance. Projects involving soil disturbance will initially be screened by Public Works Regulatory Affairs staff to identify whether there is demonstrable evidence of prior soil disturbance at the project site to the maximum vertical and horizontal extent of the current project's planned disturbance. Public Works will complete the Public Works Preliminary Archeological Checklist (PAC), Part I only (see Attachment D **[Public Works' Standard Construction Measures for Public Works Projects, June 26, 2017]**). For projects where prior complete soil disturbance has occurred throughout areas of planned work, Public Works will provide evidence of the previous disturbance in the environmental application to be reviewed by Environmental Planning (EP) Archeological staff.

1. For projects that are on previously undisturbed sites or where the depth/extent of prior soil disturbance cannot be documented, or where the planned project-related soil disturbance will extend beyond the depth/extent of prior soil disturbance, additional screening will be carried out as detailed below and shown on the flow chart titled "Public Works Standard Construction Measure #9 Archeological Assessment Process" (see Attachment E **[Public Works' Standard Construction Measures for Public Works Projects, June 26, 2017]**). The EP Archeologist will complete the Preliminary Archeological Checklist, Part II (PAC) for the project, which will include recommendations for one of three Standard Archeological Measures (I - Discovery, II - Monitoring, or III - Testing/Data Recovery) to be implemented by Public Works to protect and/or treat significant archeological resources identified as being present within the site and potentially affected by the project (see Attachments F, G and H **[Public Works' Standard**

Construction Measures for Public Works Projects, June 26, 2017]). Additional research and documentation, such an Archeological Research Design and Treatment Plan (ARDTP), Archeological Sensitivity Study (ASA), or an archeological field survey, may also be requested by the EP Archeologist. These documents should be completed by a qualified consultant from the EP Archeological Resources Consultant Pool and should by scoped, reviewed, and approved by the EP Archeologist.

2. Public Works shall implement the PAC recommendations prior to and/or during project construction consistent with Standard Archeological Measures I, II, and III, and shall consult with the EP Archeologist in selecting a qualified archeological consultant from the EP Archeological Resources Consultant Pool, as needed, to implement these measures.
3. Soil-disturbing activities in archeologically sensitive areas, as identified through the above screening, will not begin until required preconstruction archeological measures of the PAC (e.g., preparation of an Archeological Monitoring Plan, Archeological Treatment Plan, and/or an Archeological Research Design and Data Recovery Plan) have been implemented.

Public Works, the EP Archeologist and the ERO will revisit the PAC process outlined above one year after these measures are finalized.

Historic (Built Environment) Resources. Public Works will consult with CCSF Planning Department Preservation staff to determine if projects that would modify an existing building, structure, or landscape feature require preservation review and if a Historic Resource Evaluation (HRE) will be required. The HRE will be prepared by a qualified architectural historian and will be scoped with CCSF Planning Department Preservation staff. Where the potential for the project to have adverse effects on an historical resource is identified by CCSF Planning Department Preservation staff, the CCSF Planning Department Preservation Planner will consult with Public Works to determine if the project can be conducted as planned or if the project design can be revised to avoid the significant impact. If these options are not feasible, the project will need to undergo further environmental review with the CCSF Planning Department and mitigation may be required. If so, the project would not qualify for a Categorical Exemption from CEQA review.

Within historic districts established by ordinance, and/or mapped by the San Francisco Planning Department as eligible for or on the California Register of Historic Resources and/or the National Register of Historic Places, all distinctive sidewalk elements such as brick surfacing, brick gutters, granite curbs, cobblestones and non-standard sidewalk scoring, and streetscape elements that may include, but are not limited to, streetlights, sidewalk lights, sidewalk elevators and chutes, benches, and utility plates, that appear to be 45 years or older will be treated as potentially character-defining features of their respective historic districts. For those locations, historic materials will be protected in place (preferred method), salvaged and re-installed, or replaced in kind to match the existing color, texture, material, and character of the existing condition.

Where construction will take place in proximity to a building or structure identified as a significant historical resource but would not otherwise directly affect it, Public Works will implement protective measures, such as but not limited to, the erection of temporary construction barriers to ensure that inadvertent impacts to such buildings or structures are avoided. These measures shall require the development of a Construction Best Practices for Historical Resources Plan and a plan outlining the Construction Monitoring for Historical Resources Program to be reviewed and approved by CCSF Planning Department Preservation staff.

If a project includes or is directly adjacent to historic buildings or structures susceptible to vibration (such as but not limited to unreinforced masonry, earthen construction, lathe and plaster, or fragile architectural ornamentation) as determined in consultation with CCSF Planning Department Preservation staff, Public Works will determine if vibrations associated with proposed construction activities has the potential to cause damage to such buildings or structures. Generally, vibration below 0.12 inches per second peak particle velocity does not have the potential to damage sensitive buildings or structures. A vibration study may be necessary to determine if such vibration levels will occur. If Public Works determines in consultation with CCSF Planning Department Preservation staff that vibration damage may occur, Public Works will engage a qualified historic architect or historic preservation professional to document and photograph the preconstruction condition of the building and prepare a plan for monitoring the building during construction. The monitoring plan will be

submitted to and approved by CCSF Planning Department Preservation Planner prior to the beginning of construction and will be implemented during construction. The monitoring plan will identify how often monitoring will occur, who will undertake the monitoring, reporting requirements on vibration levels, reporting requirements on damage to adjacent historical resources during construction, reporting procedures to follow if such damage occurs, and the scope of the preconstruction survey and post-construction conditions assessment.

If any damage to a historic building or structure occurs, Public Works will modify activities to minimize further vibration. If any damage occurs, the building will be repaired following the Secretary of the Interior's Standards for the Treatment of Historic Properties under the guidance of a qualified historic architect or historic preservation professional in consultation with CCSF Department Preservation Planner.

Note:

[1] Soil is defined as native earthen deposits or introduced earthen fill. Soil does not include materials that were previously introduced as part of the roadway pavement section including asphalt concrete wearing surface, roadway base, and subbase.

Source: San Francisco Public Works Standard Construction Measures for Public Works Projects, June 26, 2017 (see **EIR Appendix C**).

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EIR Appendix C, San Francisco Public Works' Standard Construction Measures for Public Works Projects and Draft Construction Contract Procedures, contains a copy of the SCMs and other measures. In addition to these SCMs, the proposed project would also be subject to other pertinent City regulations governing construction in the public right-of-way. One such regulation is public works code section 2.4.20, which requires contractors to prepare a parking plan when conducting major excavation activities (i.e., excavation expected to last more than 30 days, which is assumed for the proposed project). The plan would be subject to review and approval by public works.

CONSTRUCTION DURATION

The SFMTA estimates that construction of the proposed project would take three to four years to complete, with construction beginning in 2023 and building occupancy by the end of 2026 As explained above, during construction, the bus parking, operations, and maintenance support functions would temporarily relocate to other SFMTA facilities. The three- to four-year construction period would include some overlapping phases of demolition, excavation, foundation work, and building construction. As shown in **Table 2.4: Construction Duration by Phase**, site preparation and demolition would last approximately two months. Excavation, shoring, grading, and installation of piles for the foundation system would last approximately six months. Completion of the foundation system and basement construction would last approximately two months. Building construction would last approximately 26 months, with paving and architectural coating estimated to take a month each.

Table 2.4: Construction Duration by Phase

Construction Phase	Duration (months)
Site Preparation and Demolition NOTE A	2
Excavation, Shoring, Grading, and Pile Installation NOTE A	6
Foundation and Basement Construction NOTE A	2
Building Construction	26
Paving	1
Architectural Coatings	1
Total Duration	**38**

Note:
NOTE A Site preparation, demolition, excavation, shoring, grading, and pile installation and completion of the foundation and below-grade portion of structure can be reasonably assumed to include schedule overlaps that would allow an expedited 36-month construction schedule.

Source: SFMTA 2020.

Construction-related activities would typically occur Monday through Saturday, between 7 a.m. and 8 p.m. as allowed in San Francisco, with most work occurring between Monday through Friday. Nighttime construction is anticipated for certain activities such as major concrete pours; however, construction on Sundays and major legal holidays is not anticipated.

CONSTRUCTION STAGING

Construction staging would occur on-site and on the surrounding sidewalks. There would be no pedestrian access to the sidewalks surrounding the site for most or all of the construction period. The existing bus stop at the southeast corner of Bryant and 17th streets would be relocated or removed. On Mariposa Street between Bryant and Hampshire streets, the parking lanes on the north side and the westbound travel lane would be closed during the first 12 months of construction to provide for additional space for staging. Westbound vehicles on Mariposa Street would be detoured to 17th and/or 18th streets, which are both two-way streets. Hampshire Street between 17th and Mariposa streets would be partially closed on a temporary, as-needed basis to provide additional space for laydown and staging.

DEMOLITION, EXCAVATION, AND FOUNDATION

Site preparation would begin with demolition and clearing of the existing building, vehicle service pits, foundations, control booth, and paved areas on the east side of the project site. On the west side the paved areas of the bus storage yard, obsolete utilities, overhead catenary system support poles and cables, bus wash station infrastructure, surround retaining walls and fencing, and any other at-grade elements, including the adjacent sidewalks, would be demolished. All demolition debris would be removed from the site.

Construction of the proposed building would require excavation to a depth of approximately 35 feet below ground surface for the basement level, with slightly greater excavation for vehicle maintenance pits (i.e., lower-level work areas) and elevator pits. Assuming full demolition and excavation to a depth of 35 feet across the whole site, approximately 248,900 cubic yards of soils would need to be removed from the site.

Based on information in the preliminary geotechnical investigation (geotechnical report) for the proposed project, dewatering and pre-treatment prior to release to the combined sewer system would be required given anticipated excavation depths beneath the groundwater table.[66] Below-grade excavation would require the replacement of some or all of the retaining walls along the north, east, and west sides of the site, and temporary shoring would be needed to support the planned cuts for the final basement configuration. The proposed foundation system would consist of a shallow foundation of spread footings at column locations or a structural mat slab bearing on bedrock along the northeast portion of the site with a deeper foundation bearing on pile groups to support development in other areas of the site.[67] The project would include a deep foundation

[66] ARUP/RYCG, SFMTA Potrero Yard Facility Rebuild Geotechnical Engineering Report, November 11, 2019, p. 22.
[67] ARUP/RYCG, SFMTA Potrero Yard Facility Rebuild Geotechnical Engineering Report, November 11, 2019, pp. 27-39.

system supported by driven steel H-piles; however, non-displacement auger cast in place piles are also identified as an option in the geotechnical report.

ESTIMATED CONSTRUCTION COSTS

In July 2019, construction costs for the replacement transit facility and joint development (including the residential and commercial components) were estimated at approximately $495 million in 2019 dollars.

E. PROJECT VARIANTS

The SFMTA is considering four proposed variations on features of the proposed project: an Emergency Exit Relocation Variant, a Joint Development Lobby Relocation Variant, an Active 17th Street Variant, and an Employee and Family Support Variant. The first three project variants are the same as the proposed project except for the specific variations to the project described below. The last variant is also similar to the proposed project but would require site program revisions.

Each variant could be selected by the project sponsor team and decision-makers, and any variant or combination of variants could be included in the proposed project as part of an approval action. These variants do not require modifications to the proposed building envelope of the programmed development under the proposed project. Therefore, the physical environmental effects of the project variants would be the same as, or similar to, those of the proposed project. See the relevant environmental topic sections in **EIR Chapter 3, Environmental Setting and Impacts**, and **Section E** of the initial study (**EIR Appendix B**) for an analysis of the impacts of the proposed project and its project variants and a discussion of the mitigation measures identified to address those impacts. Where the environmental impacts of a project variant would be different from those identified for the proposed project, the impacts of the proposed project and project variant(s) are described and analyzed separately.

EMERGENCY EXIT RELOCATION VARIANT

Under this project variant, the proposed emergency exit and 42-foot-wide curb cut on 17th Street west of Hampshire Street that would replace the existing 52-foot-wide curb cut and driveway would be relocated to Hampshire Street south of 17th Street (see **Figure 2.3** and **Figure 2.15**, pp. 2.20 and 2.39, respectively). The relocated emergency exit would introduce a new curb cut on Hampshire Street and would result in the loss of up to five of the existing 43 perpendicular parking spaces adjacent to the project site. Turning movements necessary for trolley buses that would use this exit would also result in the loss of two of the existing 26 parking spaces on the east side of Hampshire Street south of 17th Street to provide adequate right-of-way so that the buses could exit and turn right or left on Hampshire Street. Additional street trees would be planted on 17th Street

because the curb cut and driveway would be removed, and fewer trees would be retained and/or replaced on Hampshire Street. The Emergency Exit Relocation Variant would not result in any changes to the development program.

JOINT DEVELOPMENT LOBBY RELOCATION VARIANT

Under this project variant, the joint development lobby proposed on Mariposa Street between York and Hampshire streets would be relocated to Hampshire Street north of Mariposa Street to improve the pedestrian environment for future residents by limiting crossings of multiple bus driveways and curb cuts on Mariposa Street. (See **Figure 2.3** and **Figure 2.13**, pp. 2.20 and 2.37, respectively.) The proposed entrances/exits for the trolley buses and the SFMTA lobby on Mariposa Street east of York Street, as well as internal bus circulation aisles, maintenance bays, and storage, would be reprogrammed to allow for siting the joint development lobby adjacent to the proposed passenger loading zone on Hampshire Street. The Joint Development Lobby Relocation Variant would not result in any changes to the development program.

ACTIVE 17TH STREET VARIANT

Under this project variant, the proposed location of active ground-floor uses would be modified to include those uses along the 17th Street frontage. (See **Figure 2.3** and **Figure 2.12** through **Figure 2.16**, p. 2.20 and pp. 2.36-2.40, respectively.) The ground-floor commercial use proposed along Bryant Street would be relocated to 17th Street, and the internal ramps on the north portion of the site would be shifted to a more southerly location. The Active 17th Street Variant would not result in any changes to the development program.

EMPLOYEE AND FAMILY SUPPORT VARIANT

Under this project variant, the proposed mix of non-transit uses would be modified to include a childcare or related use in a portion of the space identified in the proposed project for the ground-floor commercial use along Bryant Street. (See **Figure 2.3** and **Figure 2.13**, pp. 2.20 and 2.37, respectively.) Under this variant, the proposed 33,000-gross-square-foot ground-floor commercial use would be reduced by 9,000 gross square feet to accommodate a new use. Thus, unlike the other project variants, the Employee and Family Support Variant would result in changes to the development program.

The proposed 9,000-gross-square-foot childcare use would serve up to 100 children and include 25 future employees. The proposed use would be limited to children of SFMTA employees and future residents or building tenant(s) (i.e., the commercial use in remaining 24,000-gross-square-foot ground-floor space). On-street curb regulations for Bryant Street under the proposed project would include (from north to south) a Muni bus stop (existing), nine vehicle parking spaces, a 40-foot-long commercial vehicle loading zone, and a 60-foot-long passenger loading zone (see

Figure 2.3). Thus, without reconfiguring the proposed commercial and passenger loading zones, under this variant up to nine on street parking spaces would be converted to passenger loading for the childcare use. Open space needs would be met onsite as part of the programmed open space on the rooftop of the 75-foot-tall transit facility podium, at Franklin Square directly across from the project site, or a combination thereof. The proposed raised crosswalk and rectangular rapid flash beacon for the pedestrian crossing of 17th Street at Hampshire Street would facilitate safe use of Franklin Square and elevators would allow access to the rooftop open space.

F. ANTICIPATED PROJECT APPROVALS

Implementation of the proposed project or its variants would require changes to the existing development controls for the project site through planning code and zoning map amendments, including changes to accommodate the newly proposed mix of land uses and the proposed building's height/bulk. The following is a preliminary list of anticipated approval actions for the proposed project or its variants and is subject to change. These approvals may be considered by City decision-makers in conjunction with the required environmental review, but they may not be granted until the required environmental review has been completed and certified.

ACTIONS BY THE SAN FRANCISCO PLANNING COMMISSION

- Adoption of Findings of Consistency with the general plan and priority policies of planning code section 101.1
- Recommendation to the San Francisco Board of Supervisors (board of supervisors) to amend the general plan, including but not limited to the Mission Area Plan and the Urban Design Element
- Recommendation to the board of supervisors to amend the planning code and zoning maps by 1) establishing a Special Use District (SUD) to accommodate residential and commercial uses and to designate the boundaries of the SUD; (2) maintaining the underlying zoning from P (Public); and (3) changing the height and bulk designation from 65X to a designation that accommodates heights to a maximum 150 feet
- Approval either through a Conditional Use authorization under planning code section 303, Large Project authorization under planning code section 329, or similar project authorization pursuant to the SUD

ACTIONS BY THE BOARD OF SUPERVISORS

- Adoption of Findings of Consistency with the general plan and priority policies of planning code section 101.1
- Approval of amendments to the general plan, planning code, and zoning maps
- Approval of a Project Agreement and ancillary sub-agreements, as needed, with the selected Principal Project Company, binding the SFMTA and the Principal Project Company into a commercial and financial obligation for the construction and maintenance of the project, and operation of the Housing and Commercial Component

- Approval of a Lease Agreement (or other similar disposition agreement) for the Principal Project Company to operate the Housing and Commercial Component
- Approval of a resolution approving and authorizing the Director of the Mayor's Office of Housing & Community Development to execute a loan agreement, or other similar funding agreement, to finance a portion of the construction of affordable, multifamily rental housing.

ACTIONS BY OTHER CITY DEPARTMENTS

- San Francisco Municipal Transportation Agency
  - Recommendation to the board of supervisors of a Project Agreement, and ancillary sub-agreements, as needed, with the selected Principal Project Company, binding the SFMTA and the Principal Project Company into a commercial and financial obligation for the construction and maintenance of the project
  - Recommendation to the board of supervisors of a Lease Agreement (or other similar disposition agreement) for the Principal Project Company to operate the Housing and Commercial Component
  - Approval of request for on-street passenger (white) loading zones on Bryant and Hampshire streets
  - Approval of a special traffic permit from the Streets Division if sidewalk(s) are used for construction staging and pedestrian walkways are constructed in the curb lane(s)
  - Approval of construction within the public right-of-way (e.g., bulbouts and sidewalk extensions) to ensure consistency with the Better Streets Plan
  - Approval of the placement of bicycle racks on the perimeter sidewalks
  - Other actions and approvals related to its jurisdictional authority
- San Francisco Mayor’s Office of Housing and Community Development
  - Recommendation to the board of supervisors of a resolution approving and authorizing the Director of the Mayor's Office of Housing & Community Development to execute a loan agreement, or other similar funding agreement, to finance a portion of the construction of affordable, multifamily rental housing.
- San Francisco Public Works
  - Public hearing and approval of permits to remove and replace street trees on 17th, Hampshire, and Bryant streets
  - Approval of a street space permit from the Bureau of Street Use and Mapping if sidewalk(s) are used for construction staging and pedestrian walkways are constructed in the curb lane(s)
  - Recommendation to the board of supervisors to approve legislation for sidewalk widening
  - Other actions and approvals related to its jurisdictional authority
- San Francisco Department of Building Inspection
  - Approval of demolition, excavation, grading, and building permits

  - Approval of a construction permit for non-potable water system
  - Approval of a permit for nighttime construction if any night construction work is proposed that would result in noise greater than 5 dBA above ambient noise levels, as applicable.
  - Approval of plumbing plans for non-potable water reuse system per the Non-potable Water Ordinance
  - Other actions and approvals related to its jurisdictional authority
- San Francisco Public Utilities Commission
  - Approval of an Erosion and Sediment Control Plan, in accordance with article 4.1 of the public works code
  - Approval of any changes to sewer laterals (connections to the City sewer system)
  - Approval of any changes to existing publicly owned fire hydrants, water service laterals, water meters, and/or water mains
  - Approval of the size and location of new fire, standard, and/or irrigation water service laterals
  - Approval of post-construction stormwater design guidelines including a Stormwater Control Plan, in accordance with City's 2016 Stormwater Management Requirements and Design Guidelines
  - Approval of Landscape Plan per the Water Efficient Irrigation Ordinance
  - Approval of the use of dewatering wells per article 12B of the health code (joint approval by the health department)
  - Approval of documentation for non-potable water reuse system per the Non-potable Water Ordinance
  - Other actions and approvals related to its jurisdictional authority
- San Francisco Recreation and Park Commission
  - Review and comment to the San Francisco Planning Commission about the shading or shadowing that the project will cause per planning code section 295 (Sunlight Ordinance)
  - Actions and approvals related to its jurisdictional authority
- San Francisco Department of Public Health
  - Approval of a site mitigation plan per San Francisco Health Code article 22A (Maher Ordinance)
  - Approval of a construction dust control plan per San Francisco Health Code article 22B (Construction Dust Control Ordinance)
  - Approval of the use of dewatering wells per article 12B of the health code (joint approval by the San Francisco Public Utilities Commission)
  - Review and approval of design and engineering plans for the non-potable water reuse system and testing prior to issuance of Permit to Operate
  - Other actions and approvals related to its jurisdictional authority

- San Francisco Arts Commission
    - Recommendation of the Visual Arts Committee and approval by the Arts Commission of public art installation as required by San Francisco Administrative Code Section 3.19 (Art Enrichment Ordinance)
    - Multi-phase approval of the project design by the Civic Design Review Committee at the project's schematic design, design development, and construction document phases.

ACTIONS BY OTHER GOVERNMENT AGENCIES

- Bay Area Air Quality Management District
    - Approval of any necessary air quality permits for installation, operation, and testing (e.g., Authority to Construct/Permit to Operate) for individual air pollution sources, such as boilers and emergency standby diesel generator
    - Approval of the Asbestos Dust Mitigation Plan for construction and grading operations per California Code of Regulations Title 17, section 93105

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3. ENVIRONMENTAL SETTING AND IMPACTS

A. IMPACT OVERVIEW

EIR Chapter 3, Environmental Setting and Impacts, addresses the physical environmental effects of the proposed project and project variants. This introduction to **EIR Chapter 3** presents the general format of the environmental analysis in each environmental topic section. It provides a general description of the approach to the project's analysis of environmental impacts, including cumulative projects that are considered in the cumulative impact analyses. This chapter also describes the existing environmental conditions of the project area.

This Environmental Impact Report (EIR), including the initial study (**EIR Appendix B**), analyzes the physical environmental impacts associated with implementation of the proposed project or project variants. The analysis includes consideration of environmental impacts associated with both construction and operation of the proposed project or project variants, as appropriate for the particular resource topic. As described in **EIR Chapter 2, Project Description**, pp. 2.56-2.58, the project variants are minor modifications to the project as proposed: the Emergency Exit Relocation Variant, which would relocate the bus emergency exit from 17th Street to Hampshire Street; the Joint Development Lobby Relocation Variant, which would relocate a ground-floor joint development lobby from Mariposa Street to Hampshire Street; the Active 17th Street Variant, which would relocate internal bus ramps from the north side to south side of the site to allow joint development uses along 17th Street; and the Employee and Family Support Variant, which would reprogram ground-floor commercial use to include a childcare use. Thus, for particular resource topics, such as noise and vibration, the project variants would not result in different effects than those with the proposed project. Therefore, the four variants are not analyzed separately. For topics where a separate analysis is necessary, such as Transportation and Circulation, the project variant analyses follow the proposed project analysis and, where applicable, the variants' analysis is consolidated.

SCOPE OF ANALYSIS

INITIAL STUDY

The San Francisco Planning Department (planning department) distributed a Notice of Preparation (NOP) of an EIR and Notice of Public Scoping Meeting on August 19, 2020, announcing its intent to prepare an EIR, including an initial study, and to solicit comments from the public about the scope of this EIR (the NOP is presented as **EIR Appendix A**). The initial study (**EIR Appendix B**) determined that project-specific and cumulative impacts in certain resource topic areas would not require additional analysis in the EIR because the proposed project or project variants would have no impact, less-than-significant impacts, or less-than-significant impacts with mitigation included (see p. 3.A.5 for definitions of the levels of significance). These topic areas are:

- Land Use and Planning (all topics)
- Population and Housing (all topics)
- Cultural Resources (archaeological resources and human remains)
- Tribal Cultural Resources (all topics)
- Noise (aviation-related topics)
- Greenhouse Gas Emissions (all topics)
- Recreation (all topics)
- Utilities and Service Systems (all topics)
- Public Services (all topics)
- Biological Resources (all topics)
- Geology and Soils (all topics)
- Hydrology and Water Quality (all topics)
- Hazards and Hazardous Materials (all topics)
- Mineral Resources (all topics)
- Energy (all topics)
- Agricultural and Forest Resources (all topics)
- Wildfire (all topics)

Please refer to the initial study in **EIR Appendix B** for a discussion and the impact analysis of the proposed project or project variants with respect to these resource topics.

EIR TOPICS

As determined and guided by findings of the initial study (**EIR Appendix B**), the proposed project or project variants could result in potentially significant impacts in the following topic areas:

- Cultural Resources (historic architectural resources only)
- Transportation and Circulation (all topics)
- Noise (all topics except aviation-related ones)
- Air Quality (all topics)
- Wind
- Shadow

These topics are analyzed in this chapter. Comments on the NOP submitted by mail and email and made at the public scoping meeting are briefly discussed in **EIR Chapter 1, Introduction**, pp. 1.3-1.5. The NOP comments related to the proposed project's physical environmental impacts were

considered in preparing this analysis and are addressed under the relevant environmental topics in this chapter and in **Section E** of the initial study.

Automobile Delay and Vehicle Miles Traveled

Public resources code section 21099(b)(1) required that the State Office of Planning and Research (OPR) develop revisions to the California Environmental Quality Act (CEQA) Guidelines establishing criteria for determining the significance of transportation impacts of projects that promote the "reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Section 21099(b)(2) states that upon certification of the revised CEQA Guidelines for determining transportation impacts pursuant to section 21099(b)(1), automobile delay, as described solely by level of service (LOS) or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA. Effective July 1, 2020, the new CEQA Guidelines section 15064.3 establishes vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts, declares automobile delay as not constituting a significant environmental impact (except for roadway capacity projects), and creates a presumption of no significant transportation impacts for land use projects within one-half mile of an existing major transit stop or land use projects that reduce VMT below existing conditions.

FORMAT OF THE ENVIRONMENTAL ANALYSIS

Each environmental topic considered in this chapter comprises three main subsections: Introduction, Environmental Setting, Regulatory Framework, and Impacts and Mitigation Measures.

- **Introduction**. The "Introduction" subsection includes a brief description of the types of impacts that are analyzed as well as a summary of the impacts that were scoped out in the initial study (e.g., impacts that were determined to result in a less-than-significant impact or no impact).
- **Environmental Setting**. The "Environmental Setting" subsection describes the existing conditions at the project site and in the project site vicinity. As provided in the CEQA Guidelines section 15125(a), existing conditions are generally defined as the physical environmental conditions that exist at the time an NOP is published, or if no NOP is published, at the time the environmental analysis is commenced. Thus, the existing conditions for the proposed project are those at the time the NOP was published on August 19, 2020. Existing conditions serve as the baseline physical setting for the project site and its surroundings at the beginning of the environmental review process (e.g., existing traffic conditions and noise environment).[1] The analysis of environmental impacts is focused on adverse physical changes that could result from implementation of the

[1] The analysis in this EIR considered the effects of the COVID-19 pandemic on environmental conditions and the subsequent changes in public and private business and enterprise practices. Data collected for the analysis follows department guidance and updates.

proposed project, described in the "Impacts and Mitigation Measures" subsection for each topic.

- **Regulatory Framework**. The "Regulatory Framework" subsection describes the relevant federal, state, and local regulatory requirements that are directly applicable to the environmental topic being analyzed.

- **Impacts and Mitigation Measures**. The "Impacts and Mitigation Measures" subsection describes the physical environmental impacts (i.e., the changes to baseline physical environmental conditions) that could result from implementation of the proposed project, as well as any mitigation measures that could avoid, eliminate, or reduce identified significant impacts. Where applicable, both construction and operational impacts are analyzed as well as project-specific and cumulative impacts. This subsection begins with a listing of the significance criteria used by the planning department to determine whether an impact is significant. "Approach to Analysis" explains the parameters, assumptions, and data used in the analysis. "Project Features" summarizes the particular aspects of the proposed project that are relevant to each topic.

  Under the "Impact Evaluation" discussion, each project-level impact begins with an impact statement that reflects one or more of the applicable significance criteria. Some significance criteria may be combined in a single impact statement, if appropriate. Each impact statement is identified by a subject area abbreviation (e.g., NO for Noise and Vibration) and an impact number (e.g., 1, 2, 3) for a combined alpha-numeric code (e.g., **Impact NO-1**, **Impact NO-2**, etc.).

  CEQA Guidelines section 15126.4 directs preparers of an EIR to describe feasible measures that could minimize significant adverse impacts. Mitigation measures are developed to avoid, minimize, rectify, reduce, or eliminate an impact or compensate for an impact resulting from project implementation. CEQA Guidelines section 15041 grants authority to the lead agency to require feasible changes in any or all activities involved in a project to substantially lessen or avoid significant effects on the environment. Feasible mitigation measures have been included in this chapter for specific environmental impacts where applicable.

  When potentially significant impacts are identified, mitigation measures are presented that would avoid, eliminate, or reduce significant adverse impacts of the project. All mitigation measures will be required as conditions of project approval. Each mitigation measure has the same coding as the impact statement to which it corresponds, with an "M" in front of the code to signify it is a mitigation measure (e.g., **Mitigation Measure M-AQ-1** corresponds to **Impact AQ-1**). If there is more than one mitigation measure for the same impact statement, the mitigation measures are numbered with a lowercase letter suffix (e.g., **Mitigation Measures M-CR-1a** and **M-CR-1b**). When identified mitigation measures do not reduce the impact to a less-than-significant level CEQA requires the development of a range of feasible project alternatives to address the significant and unavoidable impact.

  Improvement measures are recommended actions, agreed to by the project sponsor, which would reduce or avoid impacts found to be less than significant. Identification of improvement measures is not required under CEQA, but they are often presented in San Francisco environmental documents to inform decision-makers of additional actions that could improve the proposed project by reducing the magnitude of less-than-significant effects. Improvement measures are designated with an "I" to signify "improvement measure," the topic code, and a letter (e.g., **Improvement Measures I-TR-A**, **I-TR-B**, etc.).

SIGNIFICANCE DETERMINATIONS

Each impact statement describes the impact that would occur without mitigation. The level of significance of the impact is indicated in parentheses at the end of the impact statement based on the following terms:

- *No Impact (NI)* – No adverse physical changes (or impacts) to the environment are expected.
- *Less than Significant (LTS)* – Impact that would not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations.
- *Less than Significant with Mitigation (LTSM)* – Impact that is significant but reduced to a less-than-significant level through implementation of the identified mitigation measure(s).
- *Significant and Unavoidable with Mitigation (SUM)* – Impact that exceeds the defined significance criteria and cannot be reduced to less-than-significant levels through compliance with existing local, state, and federal laws and regulations and/or implementation of all feasible mitigation measures.
- *Significant and Unavoidable (SU)* – Impact that exceeds the defined significance criteria and cannot be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations and for which there are no feasible mitigation measures.

APPROACH TO CUMULATIVE ANALYSIS

The CEQA Guidelines require that an EIR discuss cumulative impacts of a project. CEQA Guidelines section 15355 defines cumulative impacts in the following way:

> "Cumulative Impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The discussion of cumulative impacts should reflect the severity of impact and their likelihood of occurrence, but the discussion need not provide as much detail as provided for effects attributable to the project alone (CEQA Guidelines section 15130 (b)). It should be guided by the standards of practicality and reasonableness and should focus on the cumulative impacts to which the identified other projects contribute, rather than the attributes of other projects which do not contribute to the cumulative impact.

This EIR, including the initial study, discusses the cumulative impacts analyzed for each environmental resource topic and the proposed project's or project variant's contribution to these cumulative impacts, if any. Two approaches to a cumulative impact analysis are provided in CEQA Guidelines section 15130(b)(1): (a) the analysis can be based on a list of cumulative projects producing closely related impacts that could combine with those of a project; or (b) a summary of projections contained in a general plan or related planning document can be used to determine cumulative impacts. A list-based approach refers to "a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside of the control of the agency" (CEQA Guidelines section 15130(b)(1)(A)). A projections-based approach refers to "a summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions" (CEQA Guidelines section 15130(b)(1)(B)).

The analysis of cumulative impacts by environmental resource topic involves the following steps:

1. determining the cumulative context or geographic scope and location of the cumulative projects relative to the affected resource's setting;
2. assessing the potential for project impacts to combine with those of other projects, including the consideration of the nature of the impacts and the timing and duration of implementation of the proposed and cumulative projects;
3. determining the significance of the cumulative impact; and
4. assessing whether the project's contribution to a significant cumulative effect is considerable.

CEQA does not prescribe the use of one specific approach to analyzing cumulative impacts. The rationale used to determine an appropriate list of projects considered in an individual project's cumulative analysis is explained in the discussion of cumulative impacts for each environmental topic in this EIR.

Cumulative impacts are presented in a separate subsection following each topic's project-level impact analysis. Cumulative impact statements are numbered consecutively with a combined alpha-numeric code that starts with "C" to signify it as a cumulative impact. For example, C-TR-1 refers to the first cumulative impact for Transportation and Circulation.

Projects Included in Cumulative Conditions Scenario

Table 3.A.1: Cumulative Projects presents a list of cumulative projects located within a 0.25-mile radius of the project site. These projects are considered in the various cumulative analyses for environmental resource topics that use a list-based approach to determine, for example, the potential for impacts to combine based on distance from site and construction timelines, as available. These projects are shown in **Figure 3.A.1: Cumulative Projects**, p. 3.A.9.

Table 3.A.1: Cumulative Projects

Project	Residential Units	Office (square feet)	PDR (square feet)	Retail (square feet)	Vehicular Parking (no. of spaces)	Height	Status as of December 2020
2435-2445 16th Street (2014.1201ENV)	53 NOTE A	0	0	3,265	40 (all new)	7 stories/ 68 feet (78 feet with elevator penthouse)	Building permit issued – not under construction as of December 2020
321 Florida Street (2018-016808ENV)	169 NOTE B	0	0	1,591	57 (all new)	10 stories/ 104 feet	Under environmental review
333-335 Potrero Avenue (2017-016447PRJ)	2 existing (0 net new) NOTE C	0	6,246	0	No change	5 stories/ 64 feet (74 feet with elevator penthouse)	Under planning department review – environmental review not yet conducted
1850 Bryant Street (2015-011211ENV)	0	166,728	18,407	2,285 (-11,515 net change)	91 (27 net new) NOTE D	5 stories/ 68 feet	Building permit issued – not under construction as of December 2020
2601 Mariposa Street (2018-013621ENV)	0	40,282	90,136	0	85 (-4 net change) NOTE E	3 stories/ 64 feet (75 feet with addition)	Construction will be completed by end of 2021 prior to project construction
681 Florida Street (2017-014088PRJ)	130 NOTE F	0	9,140 (-9,860 net new) NOTE G	0	0	9 stories/ 87 feet (96 feet with elevator penthouse)	Building permit issued – under construction
2750 19th Street (2014.0999ENV)	60	0	10,000		26	6 stories/ 68 feet (78 feet with rooftop equipment)	Building permit issued – not under construction as of December 2020
2747 19th Street (2019-020627ENV)	1	10,795 (3,230 net new) NOTE H	0	0	10 (-2 net change) NOTE I	4 stories/ 39 feet	Under planning department review – Categorical Exemption issued 12/30/2019
300 Kansas Street (2018-001122ENV)	0	0	137,500 (106,686 net new) NOTE J	0	60 (53 net new) NOTE K	6 stories/ 68 feet	Building permit under review
312 Utah Street (2019-022419ENV)	3	0	0	0	4 (2 existing, 2 net new)	4 stories	Under planning department review

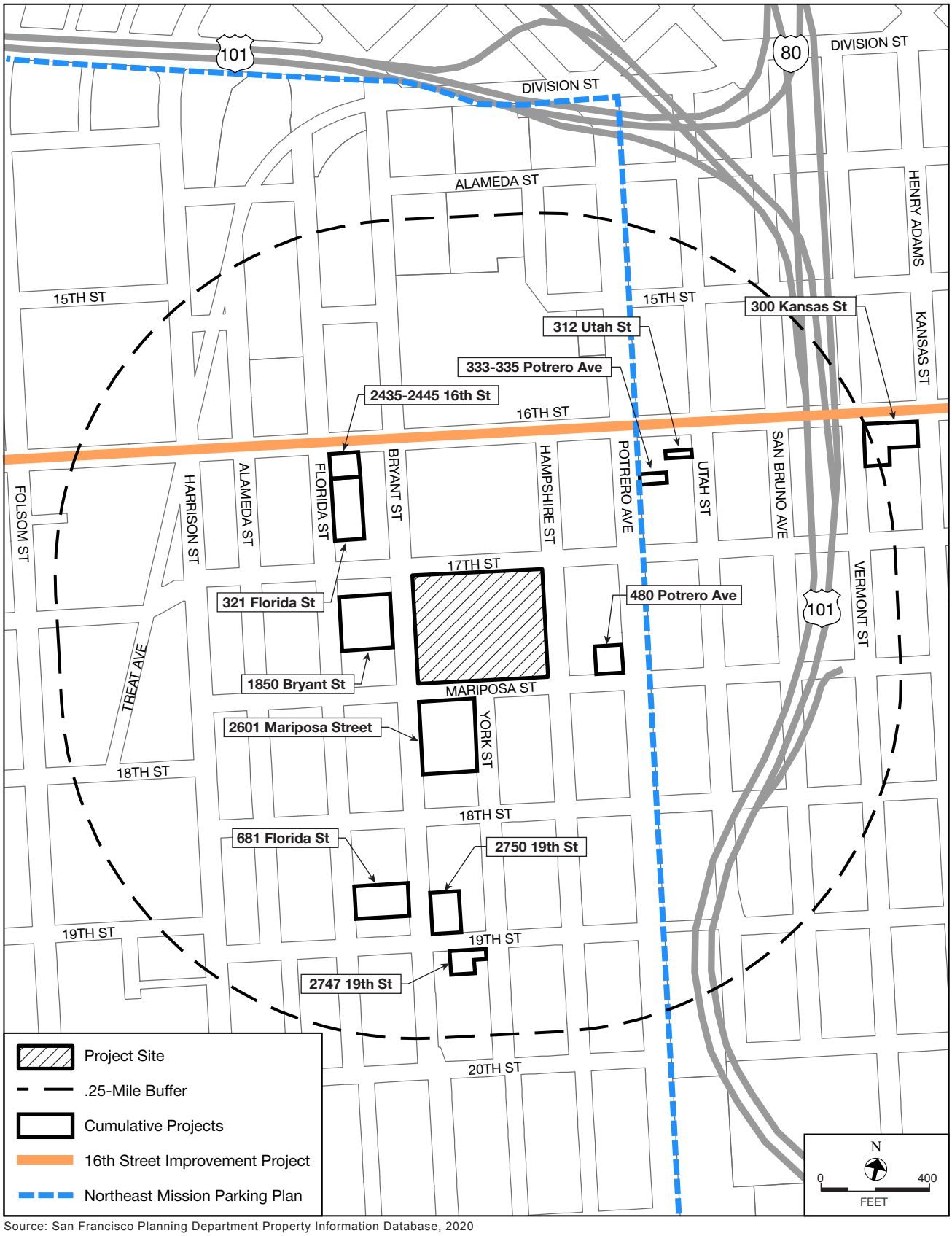
Project	Residential Units	Office (square feet)	PDR (square feet)	Retail (square feet)	Vehicular Parking (no. of spaces)	Height	Status as of December 2020
480 Potrero Avenue (2019-022810PRJ)	1 NOTE M	0	0	0 (-841 net new)	47 (0 net new)	6 stories / 58 feet	Planning department approved – CEQA Class 1 Categorical Exemption issued 10/15/20 – building permit under review
Totals ***(Net New)***	**419** ***(417)***	**217,805** ***(210,240)***	**271,429** ***(221,615)***	**7,141** ***(-7,500)***	**452** ***(199)***	*NA*	*NA*

Notes:
[A] 5 three-bedroom units, 18 two-bedroom units, and 30 one-bedroom units
[B] 68 two-bedroom units, 37 one-bedroom units, and 64 studio units– with 31 affordable units
[C] Expansion of two existing residential units
[D] Project application and approval documents indicate a 27,300-square-foot existing surface lot. For purposes of estimates in this table, equates to approximately 64 existing parking spaces, but 91 spaces provided in project; therefore, about 27 net new spaces.
[E] 89 existing parking spaces, but 85 spaces in project; therefore, -4 net new spaces
[F] 44 studios, 31 one-bedroom units, 38 two-bedroom units, and 17 three-bedroom units – all 130 units are affordable units
[G] Project replaces 19,000 square feet of production, distribution, and repair use
[H] 10,795 square feet of office, with 3,230 net new
[I] 12 existing parking spaces, but 10 spaces in project; therefore, -2 net new spaces
[J] 137,500 square feet of production, distribution, and repair use, with 106,686 square feet net new
[K] 7 parking spaces existing, but 60 spaces in project; therefore, 53 net new spaces
[L] Project involves demolition of one 17,600-square-foot commercial building and conversion of space to UPS trailer staging area. Site improvement work includes grading, paving, storm water treatment, chain link fence and gates, site lighting, and trash enclosure.
[M] Existing ground-floor commercial uses onsite would be converted to one new residential unit
Source: San Francisco Planning Department, Property Information Map Database, December 2020.

In addition to the development projects identified above, the following transportation projects are considered part of the cumulative setting:

1) 16th Street Improvement Project (currently under construction, with completion scheduled for spring 2022, before construction of the proposed project or project variants would begin)
2) SFMTA Northeast Mission Parking Management Plan (currently in the planning phase)

Other active projects in the project vicinity consist of minor modifications to existing buildings and residences, such as window replacements, installation of rooftop solar collection systems, and construction of decks. Given their minor scope, they would not combine with the proposed project or project variants in a way that could result in any cumulative impacts; therefore, they are not included in the cumulative context for any topic in the EIR.



Source: San Francisco Planning Department Property Information Database, 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 3.A.1: CUMULATIVE PROJECTS

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B. HISTORIC ARCHITECTURAL RESOURCES

INTRODUCTION

EIR Section 3.B, Historic Architectural Resources, assesses project impacts on "historical resources," as defined by the California Environmental Quality Act (CEQA) Guidelines section 15064.5.[1] Other cultural resources topics (i.e., archeological resources and human remains) and Tribal Cultural Resources are discussed in sections E.4 and E.5, respectively, of the initial study (see **EIR Appendix B**, pp. 27-38).

CEQA Guidelines section 15064.5(a), in Title 14 of the California Code of Regulations, defines a "historical resource" as follows:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources.

(2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources.

(4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

Therefore, under the CEQA Guidelines, even if a resource is not included on any local, state, or federal register, or identified in a qualifying historical resources survey, a lead agency may still determine that any resource is a historical resource for the purposes of CEQA if there is substantial evidence supporting such a determination. A lead agency must consider a resource to be historically

[1] California Code of Regulations, Title 14: Natural Resources, Division 6: Resources Agency, Chapter 3: Guidelines for Implementation of the California Environmental Quality Act, Article 5: Preliminary Review of Projects and Conduct of Initial Study, Section 15064.5: Determining the Significance of Impacts to Archaeological and Historical Resources, *https://govt.westlaw.com/calregs/Document/IA0E0C760D48811DEBC02831C6D6C108E?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)*, accessed November 11, 2020.

significant if it finds that the resource meets the criteria for listing in the California Register of Historical Resources (California Register).

The assessment of a project's impacts on historical resources is a two-step analysis: first, the project site is analyzed to determine if it contains a "historical resource(s)" as defined under CEQA; second, if the site is found to contain historical resources, an analysis is carried out to determine whether the project could cause a substantial adverse change to the resource. A project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment (Public Resources Code section 21084.1).

Issues identified in response to the Notice of Preparation (NOP) of an EIR and Notice of Public Scoping Meeting (**EIR Appendix A**) related to the proposed project's physical environmental impacts were considered in preparing this analysis. The San Francisco Planning Department (planning department) received some comments related to historic preservation (see **EIR Chapter 1, Introduction**, pp. 1.3-1.5).

ENVIRONMENTAL SETTING

This historic architectural resources section is based on the Historic Resource Evaluation (HRE), prepared for the proposed project by an independent historic architectural resource consultant;[2] the planning department's Historic Resource Evaluation Response, 2500 Mariposa Street, Part I: Historic Resource Evaluation (HRER Part I);[3] and the department's Historic Resource Evaluation Response, 2500 Mariposa Street, Part II: Project Evaluation (HRER Part II).[4] The HRE consists of a site and architectural description, relevant historic contexts, and a historic significance evaluation under California Register eligibility criteria. The planning department has reviewed the HRE and concurs with the HRE's analyses and conclusions which are summarized in the HRER Part I.

PROPERTY HISTORY AND DESCRIPTION

History

The San Francisco Municipal Railway (Muni), including the Potrero Trolley Coach Division Facility, was designed by Michael M. O'Shaughnessy, Chief Engineer (chief engineer) for the City and County of San Francisco's Office of the City Engineer between 1912 and 1933. The Potrero Trolley Coach Division Facility was historically known as the Potrero Car Barn. The one-story car

[2] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, California, October 2, 2017. (See **EIR Appendix D-1**.)

[3] San Francisco Planning Department, Historic Resource Evaluation Response, 2500 Mariposa Street, Part I: Historic Resource Evaluation, September 25, 2020. (See **EIR Appendix D-2**.)

[4] San Francisco Planning Department, Historic Resource Evaluation Response, 2500 Mariposa Street, Part II: Project Evaluation, September 25, 2020. (See **EIR Appendix D-3**.)

barn was originally built in 1915. In 1924, the building was enlarged with second-story additions for offices along Mariposa Street (the office wing) and two maintenance shops along Hampshire Street with access from 17th Street (the shops wing). In 1948-1949 the facility was converted into an electric trolley coach transit storage and maintenance facility with a paved bus storage yard occupying the western half of the site, including the vacated York Street right-of-way. This remains the current use.

Description

Site Plan

The approximately 192,000-square-foot (or 4.4-acre) project site occupies the equivalent of roughly two typical city blocks (200 by 400 feet) and is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west (see **Figure 2.2: Existing Site Plan** in **EIR Chapter 2, Project Description**, p. 2.5). The site slopes up toward the north and east (17th and Hampshire streets) and downhill toward the south and west (Mariposa and Bryant streets).

The site is divided roughly in half. The western half of the site (approximately 112,450 square feet) is occupied by the electrified bus storage yard and is paved with asphalt, with painted and numbered parking lanes in the center of the yard. The yard is enclosed on three sides by 10-foot-high steel fencing topped with outward curving balusters; it is accessed only from the south on Mariposa Street. The eastern half of the site is occupied by the 109,000-gross-square-foot maintenance and operations building. The second floor of this building includes a parking deck accessed from 17th Street with additional maintenance and body shops along the Hampshire Street side and offices along the Mariposa Street side. The elevation between the site and surrounding sidewalks and streets varies, and, due to the elevation changes, reinforced concrete retaining walls run along the western portion of 17th Street and along the northern portion of Bryant Street. Integral retaining walls are in place within the maintenance and operations building along the eastern portion of 17th Street and along Hampshire Street.

MAINTENANCE AND OPERATIONS BUILDING

The maintenance and operations building, which occupies the eastern half of the site, is in the Renaissance Revival-style, a late 19th-Century style of architecture based on Italian classical architecture from the 16th Century used widely throughout the United States for government buildings. Originally built in 1915 as a one-story car barn, the building's first story is at grade along Mariposa Street (but set back 25 feet from the property line) and below grade along 17th Street due to a cut into the natural slope of the site that was made when the streetcar barn was constructed. The building has metal-framed windows of various types, including non-operable fixed-in-place windows; "double-hung" windows that are divided into two panels with six panes on the top and

six panes on the bottom, in which one or both panels slide up and down (referred to as "six-over-six double-hung windows"); and industrial-style "awning" windows with a hinged panel that opens outward. With the exception of the second-floor parking deck, all portions of the building are capped by flat roofs. Linear maintenance bays occupy the majority of the first floor of the maintenance and operations building, with north-south heavy and running repair bays separated by a row of large concrete piers. Shops and offices are located along the west, north, and east perimeters of the first floor. The floors are formed of thick concrete and the walls and ceilings are made of poured-in-place, board-formed concrete. The ceilings are divided into coffers by oversized beams that run from east to west across the building. All buses that need maintenance services enter the building from the drive aisle/northernmost bay on the building's west elevation, accessed from the paved bus storage yard, and exit from the bays on the building's south elevation along Mariposa Street that serve as vehicular entrances/exits.

The following sections describe the four exterior elevations or façades of the maintenance and operations building as well as the façades or exteriors of the accessory buildings on the project site, i.e., the control centers on Mariposa Street and on 17th Street near Hampshire Street that regulate all bus access to the paved bus storage yard and second-floor parking deck, respectively.

Primary (Mariposa Street) Façade

The office wing of the maintenance and operations building is set back 25 feet from the Mariposa Street property line. Its primary façade faces Mariposa Street and is largely symmetrical. The first story is divided into seven bays. The piers between each bay are adorned with flat pilasters capped by a classically inspired capital. From west to east, the first bay projects several inches and has been infilled. The frieze above is engraved with "MUNICIPAL RAILWAY AD 1915." Immediately above is a row of dentils. The second bay is infilled with concrete and serves as both a vehicle entrance, via a vehicular door for San Francisco Municipal Transportation Agency (SFMTA) deliveries, and as a pedestrian entrance for SFMTA staff, via an aluminum storefront entrance. Each of the remaining five bays serves as a vehicle entrance that spans the full height and width of the bay. The first story is finished with a simple frieze and cornice. The second story of the Mariposa Street façade was constructed in 1924 as an addition, and like the first story below, it is divided into seven bays. The second story houses the SFMTA's operations department and includes offices, training facilities, a dispatch office, men's and women's toilet rooms, a locker room, and a common room for the use of bus operators on break or between shifts. A projecting band spans the entire façade, forming a sill to groups of three six-over-six double-hung windows. Above the windows in the eastern-most bay is a raised medallion featuring Muni's original logo. The second story is finished with a cornice and has a wooden flagpole located on the east end of the roof behind the parapet of the easternmost bay. Other decorative details along this façade include re-entrant corner details at the east and west ends.

To the south of the westernmost bay on the Mariposa Street façade is a small, free-standing, one-story, 12-sided control center (built in 1990) for regulating access to the bus yard. A row of windows wraps around all sides of the control center.

Secondary (Hampshire Street) Façade

The Hampshire Street façade is asymmetrical. At the far south corner near Mariposa Street the two-story façade features the same frieze and cornice as the Mariposa Street façade (i.e., the office wing). The ground floor contains a pedestrian entrance capped by a classically inspired cable molding and Tuscan architrave. The frieze above is engraved with "OFFICE." Approximately 10 feet north along Hampshire Street are three multi-light steel fixed windows with an operable sash in the middle. At the second story, the portion of the façade closest to Mariposa Street contains four double-hung metal windows that match those on the primary façade. The remaining portion of the Hampshire Street façade then recedes several inches and has an increase in parapet height by a few feet, followed by a single six-light[5] fixed window and two pairs of six-light fixed windows. As the grade changes moving north, the remainder of the façade, which is largely a blank wall with no windows, continues to match the change in grade approaching 17th Street. This portion features a simplified cornice with a circular dot motif at the top of the parapet and the intermediate sill and cornice from the primary facade. As part of the conversion from a streetcar barn to a trolley coach facility, which was completed in 1948-1949, the northernmost portion of the Hampshire Street façade and shops wing was demolished and replaced by a short wall featuring a control center at 17th and Hampshire streets.

Tertiary (17th Street) Façade

The first story of the 17th Street façade is approximately 20 feet below grade because of the differences in elevation between the site and surrounding sidewalks and streets; thus, the only visible portions are the shops wing added in 1924 and remodeled in 1948-1949 and the rear of the office wing (also added in 1924), which are set back from the 17th Street property line. The north façade of the shops wing is divided into two bays, each with a large vehicular entrance, and corresponding exits on the south. Ornamentation included with the 1924 addition was removed in 1948-1949 when the streetcar facility was converted to an electric trolley coach facility and almost 50 percent of the shops wing was demolished (north and south portions). The north (or rear) façade of the office wing (with its primary façade along Mariposa Street) is also visible from the 17th Street property line across the second-floor parking deck, although distant. It is finished in cement plaster, largely windowless, and entirely utilitarian, featuring a handful of non-historic metal doors and two metal awning windows arranged in an asymmetrical pattern.

[5] Light is a reference to the number of divisions in a window, i.e., the number of smaller panes.

At the northeast corner of the site (17th and Hampshire streets) is a small, one-story, narrow rectangular building that is connected by a wall to the secondary façade along Hampshire Street. For simplicity, the entirety of this small building is described here as part of the tertiary (17th Street) façade. It was built in 1948-1949 as part of the conversion to a trolley coach facility and formerly used as a control center for regulating bus access to the second-floor parking deck and maintenance shops. The small building has metal-framed fixed windows on its north façade that wrap around a few feet onto its east and west façades. The remainder of its east façade has no windows and is part of the northernmost part of the Hampshire Street façade built in 1948-1949 when the facility converted to an electric trolley coach facility. The east wall or façade along Hampshire Street and the former control room are finished in cement stucco and capped by a narrow crown molding. The west façade also features a pedestrian door and a band of clerestory[6] metal-framed windows. The south façade has no windows.

Quaternary (Bryant Street) Façade

The west façade is set back from the Bryant Street property line and is made up of two parts: the west façade of the second-floor maintenance bays (i.e., the shops wing) that sit on the parking deck, and the larger section that adjoins the bus yard. The larger section is further composed of two parts: the one-story maintenance shops to the north and the two-story office wing towards Mariposa Street.

The west façade of the shops wing at the east edge of the parking deck is divided into 11 bays by plain concrete piers, with every other bay accentuated by a multi-light fixed window with an awning sash in the window.

On the ground floor facing the bus yard, the one-story maintenance shops façade is divided into 18 bays but is otherwise asymmetrical. From north to south, the first bay features a large vehicle entrance and an adjoining bay with a multi-light fixed and awning window. The next four bays feature tripartite multi-light fixed and awning windows. The next two bays feature wood accordion doors. The next five bays have metal overhead rolling doors.

The southernmost part of the Bryant Street façade facing the bus yard connects with the office wing that faces Mariposa Street and features the same frieze and cornice. The first floor has been heavily altered and has several infilled windows and a new pedestrian entrance that was added in 1989-1990. The second-floor features four double-hung metal windows that match those on the primary façade.

[6] Clerestory, in this case, means a row of windows designed above the pedestrian viewing level.

HISTORIC AND ARCHITECTURAL CONTEXT

As summarized in the HRE, the project site has been evaluated under the relevant historic and architectural contexts with which it is associated. The Potrero Trolley Coach Division Facility is associated with historic context themes of the early development of Showplace Square; the San Francisco Municipal Railway; and American Car Barns and Bus Yards. It is associated with the architectural context themes of the characteristics of a car barn; the post-Earthquake period of reconstruction; and the work of Michael M. O'Shaughnessy. These themes serve as the framework within which the California Register significance criteria are applied to evaluate the eligibility of the car barn for inclusion in the California Register. An overview of the historic and architectural contexts of the project site, as described in the HRE, is presented below.

Showplace Square

The Potrero Trolley Coach Division Facility is located in the northeastern portion of the Mission District in an area that is known as "Showplace Square." The name dates back to the 1970s and 1980s when wholesale design firms moved into the area's warehouses.

During the 19th Century, much of the area was isolated from the city by Mission Bay and thus remained largely rural. In the 1890s Mission Bay was filled in, enabling development to begin. Development within the area later known as Showplace Square surged after the 1906 Earthquake and fire. Industrialists moving to the area included food processors and canners, cable and belt manufacturers, steel fabricators, wholesale hardware dealers, paint manufacturers, commercial bakers, barrel makers, brewers, mattress makers, and many others. They built large brick warehouses and factories, many of which survive today. Expansion of industry in the area continued until World War II, at which time many companies relocated to South San Francisco, Emeryville, San Leandro, and other industrial suburbs to take advantage of large plots of land, better freeway access, anti-union policies, and lower taxes. These businesses were replaced by wholesale furniture and design firms.

San Francisco Municipal Railway

Muni was incorporated on April 17, 1906. Muni was created to rival the dominant United Railroads of San Francisco, who planned an expansion of the widely unpopular above-ground electrical wires used for street cars. In 1909 this dislike for United Railroads of San Francisco fueled support for two bond measures. The measures funded a streetcar line on Market Street and Geary Street from the Ferry Building out to Ocean Beach. Construction began on the line in June 1911. This became the trunk of Muni's A, B, and C streetcar lines. The project included a new streetcar barn and management offices at Presidio Boulevard and Geary Street. The barn was designed by chief engineer Michael M. O'Shaughnessy in a blend of the Renaissance Revival and Mission Revival styles. Service on the Geary line began on December 28, 1912.

In March 1913 Muni published the Report on the Improvement and Development of the Transportation Facilities of San Francisco, which guided the expansion and construction of the system for the next 15 years. From 1913 to 1915 Muni expanded its system to connect Downtown to the site of the Panama Pacific International Exposition in the Marina District. The new E line, Muni's third, opened on February 10, 1915.

While Muni's early expansion largely resulted from acquisition of other independent railroads, in 1914 it began to build its first all-new lines. These included the D, E, and H lines. During this period Muni also built its second car barn at Mariposa and Hampshire streets (now part of the current project site). Soon Muni had expanded from one line to seven: A, B, C, D, E, F, and H. In 1918, Muni completed construction of the Twin Peaks Tunnel from Castro and Market streets to the then largely rural area west of Twin Peaks. The completion of the tunnel enabled construction of several new lines: K, L, and M. A few years later Muni built a tunnel beneath Buena Vista Park, enabling the N Judah line.

American Car Barns and Bus Yards

Streetcar barns, built to store and maintain streetcars, were traditionally located at either the midpoint or an end of a line and consisted of storage and maintenance areas, offices, and power houses. In the late 19th Century, streetcar barns were typically designed in the American Commercial style and were built of brick. A surviving example is the Cable Car Barn and Powerhouse at Washington and Mason streets (built 1887, rebuilt 1906). While some were built of wood, masonry was preferred for its fire resistance and ability to enable large semi-continuous spans with multiple vehicular entrances. However, after the 1906 Earthquake and fire, concrete construction surged in popularity.

Some of the earliest car barns in the Muni system came through acquisition of the Market Street Railway in 1944. Among the oldest of these were the Haight and McAllister Streets Car Houses (built 1883), the Oak and Broderick Car House (1889), and the Sutro Car House (built 1896). All of these were demolished by Muni between 1945 and 1951. The Turk and Fillmore Car House and Powerhouse (built 1895) still exists and is designated San Francisco landmark number 105.

The first car barn commissioned by Muni, the Geary Car Barn, was built in 1912. It consisted of an eight-bay maintenance and storage facility, a corner office building, and carpentry and machine shops. Muni's second car barn, the Potrero Car Barn (project site), was built in two phases: the first-floor maintenance shops in 1914-1915 and the operations and maintenance shops wings, which were initiated in 1924 and finished in 1925.

After World War II the Lapham Plan[7] and the 1947 Muni bond spearheaded proposed changes that included replacing most of the system's streetcar lines with bus and trolley service. These changes resulted in great demand for bus storage and maintenance facilities. In 1948-1949 Muni converted both the Geary and Potrero car barns to accommodate electric-powered trolley coaches. Simultaneously Muni built two new yards to service gas-powered buses: Ocean Division Bus Yard (built 1948-1949) and Kirkland Bus Yard (built 1950). The Ocean Division was demolished in 1977.

Three more yards have been built since the Kirkland Bus Yard. The Flynn Yard was retrofitted from an existing industrial building. The other two bus yards, Woods (1974-1976) and Islais Creek (2012), were newly constructed. Like the Kirkland Yard, the latter two yards feature asphalt-paved lots for parking and storage, with small freestanding buildings for repairs and maintenance.

Designer: Michael M. O'Shaughnessy (1864-1933)

Michael Maurice O'Shaughnessy was the designer of the Potrero Trolley Coach Division Facility. O'Shaughnessy was born to a farming family in County Limerick, Ireland, in 1864. He studied at the University College in both Cork and Galway before graduating in 1884 from the University of Dublin. In 1885 he emigrated from Ireland to America and arrived in San Francisco on March 30 of that year. In 1886 the Southern Pacific Railroad hired him to work as a surveyor. In 1889 he opened his own practice, concentrating in land surveying and hydraulic engineering. In 1893 he served as the chief engineer of the California Midwinter International Exposition. In 1895 O'Shaughnessy went to work for the Spring Valley Water Company, the private predecessor to the San Francisco Water Department. For a decade or so he consulted on numerous projects for companies and municipalities. He became the chief engineer for the Southern California Mountain Water Company in 1907, overseeing water delivery systems for various communities in San Diego County.

In 1912 San Francisco Mayor James Rolph hired O'Shaughnessy as chief engineer for the City and County of San Francisco. During his time as chief engineer O'Shaughnessy led numerous major public works projects during the City's largest sustained infrastructure expansion. He oversaw the 167-mile-long Hetch Hetchy water delivery system. O'Shaughnessy also designed and constructed Muni, America's first public transit agency. His office was responsible for most associated infrastructure including tunnels, retaining walls, car barns, power houses, and office buildings. O'Shaughnessy believed his work should enhance the beauty of the city. Much of this infrastructure utilized the then popular Renaissance Revival style. In 1930, after 18 years as chief engineer, O'Shaughnessy was forced to retire. He died in 1933.

[7] The transportation-focused Lapham Plan of 1947 was named for San Francisco Mayor Roger Lapham.

HISTORIC RESOURCE EVALUATIONS OF THE PROJECT SITE

Previous Surveys

The 2008-2009 Showplace Square Survey prepared by Kelley & VerPlanck Historical Resources Consulting in conjunction with the planning department[8] as part of the department's long-range planning efforts for the Eastern Neighborhoods Plan assigned the property California Historical Resource status code "3CS."[9] The boundaries of the Showplace Square/Northeast Mission Survey[10] included the industrial parts of the northern Mission and Potrero districts, as well as small parts of the adjoining South of Market and the Mission Bay neighborhoods. It includes the Showplace Square Historic Context Statement, and State of California Department of Parks and Recreation (DPR) 523A (Primary) forms, DPR 523B (Building, Structure, and Object) forms, and DPR 523D (District) forms. The DPR 523A form briefly documented the Potrero Trolley Coach Division Facility, concentrating on the 1915 car barn, and the DPR 523B form provided a brief history of the property, identifying Michael M. O'Shaughnessy as the designer. The evaluation concluded that the Potrero Trolley Coach Division Facility is eligible for listing in the California Register under Criterion 1 (Events) and Criterion 3 (Architecture/Design/Construction), citing four reasons: 1) an example of a type (municipal car barn), 2) period of construction (World War I), 3) method of construction (reinforced concrete), and 4) the work of a master, City and County of San Francisco chief engineer Michael M. O'Shaughnessy (1912-1933).

San Francisco Heritage does not have a file on the Potrero Trolley Coach Division Facility, nor has it surveyed the Potrero District.

Current Historic Resource Evaluation

The HRE prepared for the proposed project determined that the Potrero Trolley Coach Division Facility's maintenance and operations building appears eligible for listing in the California Register under Criterion 1 (Events) "as a facility dating back to the earliest years of San Francisco's Municipal railway, the United States' first publicly owned street railway," and under Criterion 3 (Architecture/Design/Construction) "as a property that embodies the characteristics of a type (car barn), period of construction (post-quake reconstruction), as well as being the work of a master (Michael M. O'Shaughnessy)." The HRE determined that the property is not eligible under

[8] San Francisco Planning Department, Showplace Square/Northeast Mission Historic Resource Survey, *https://sfgov.org/sfplanningarchive/showplace-squarenortheast-mission-historic-resource-survey*, accessed November 11, 2020.

[9] California Office of Historic Preservation, California Historical Resource Status Codes, December 2003, *https://ohp.parks.ca.gov/pages/1069/files/chrstatus%20codes.pdf*, accessed May 28, 2021. A California Historical Resource Status Codes rating of "3CS" indicates that the resource appears eligible for listing in the California Register as an individual property through survey evaluation.

[10] Although the survey area includes parts of the Mission and the South of Market, the term Showplace Square is used throughout to refer to the entire survey area.

Criterion 2 (Persons). (See **EIR Appendix D-1, VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, CA, October 2, 2017**.)

PLANNING DEPARTMENT CALIFORNIA REGISTER ELIGIBILITY DETERMINATION

The planning department, in Parts I and II of its Historic Resource Evaluation Response (HRER), reviewed and considered the previous historic resource surveys and the HRE, and made the following determinations regarding the eligibility of the Potrero Trolley Coach Division Facility for listing in the California Register.

Criterion 1 (Events)

The Potrero Trolley Coach Division Facility is eligible for individual listing in the California Register under Criterion 1 (Events) for its association with the earliest years of San Francisco's Municipal Railway, the United States' first publicly owned street railway. San Francisco's Municipal Railway was founded in 1906 as an experiment in public ownership of a sector that had previously been dominated by private ownership. The Potrero Trolley Coach Division Facility, built in two stages in 1915 and 1924, was the railway's second car barn after the Geary Car Barn, built in 1911-1912, which was also designed by Michael O'Shaughnessy in a blend of the Renaissance Revival and Mission Revival styles.

Criterion 2 (Persons)

The Potrero Trolley Coach Division Facility does not appear to be eligible for listing in the California Register under Criterion 2. No persons associated with the property have been identified who appear to have made notable contributions to local or state history on this site such that it would be individually eligible under this criterion.

Criterion 3 (Architecture/Design/Construction)

The Potrero Trolley Coach Division Facility is eligible for individual listing in the California Register under Criterion 3 (Architecture/Design/Construction) as a property that embodies the characteristics of a car barn, for its period of construction during the post-Earthquake reconstruction, and as the work of a master, Michael M. O'Shaughnessy. Car barns originated in the late 19th Century to house and maintain streetcars. The Potrero Trolley Coach Division Facility is one of only three pre-war car barns extant in San Francisco. Unlike many American car barns, which were built either of wood or brick in the American Commercial style, the maintenance and operations building was built of reinforced concrete in the Renaissance Revival style. The Potrero Trolley Coach Division Facility is also eligible under Criterion 3 as the work of a master – Michael M. O'Shaughnessy, chief engineer for the City and County of San Francisco Office of the City

Engineer, who was the most influential and important chief engineer to hold the position in San Francisco.

Criterion 4 (Information Potential)

To be eligible for listing in the California Register under Criterion 4, a property must have the potential to yield information important in prehistory or history. Criterion 4 is generally understood to apply primarily to archeological resources. Criterion 4 may apply to architectural resources under limited circumstances where study of the physical fabric of a building may yield important scientific and historic information that is not otherwise available in the documentary record. The potential for the presence of subsurface archeological resources within the project site that pre-date construction of the Potrero Trolley Coach Division Facility is addressed in the initial study (see **EIR Appendix B**) on pp. 27-35.

Integrity

The planning department concurs with the determination in the HRE that the subject property retains sufficient integrity to convey its significance as a historic resource. The two most substantial alterations to the maintenance and operations building occurred in 1948-1949 when Muni completed the conversion of the building from a car barn into a trolley coach facility and in 1989-1990 when Muni completed a seismic retrofit and remodel of the facility.

The transition from a streetcar barn to an electric trolley coach and bus maintenance facility, completed in 1948-1949, included removing the front and rear portions of the shops wing (approximately 50 percent) and a trolley coach shop added to its west end in 1940-1941; constructing a control room at 17th and Hampshire streets and the Hampshire Street wall closest to 17th Street to close the gap created by demolishing the north portion of the shops wing; rebuilding the roof of the maintenance and operations building to accommodate a parking deck; remodeling the bays along the west façade of the maintenance and operations building; removing all ornament and replacing all fenestration; infilling the two westernmost bays and widening the easternmost bay along Mariposa Street; and removing all streetcar tracks from the site. Alterations to the office wing also included infilling several windows on the west façade and adding a new medallion with Muni's logo to the second-floor level facing Mariposa Street.

The 1989-1990 seismic retrofit and remodel of the facility included new bus wash, vacuum, and fare collection stations; new asphalt and striping; new electrical poles and catenaries on the paved bus yard; construction of a new control center near the main entrance on Mariposa Street; and the enclosure of the paved bus yard behind a metal fence. Changes to the maintenance and operations building occurred primarily to the interior. Specific changes to the exterior were limited to reconfiguring several door and window openings along the west façade facing the paved bus yard; installing five new overhead telescoping doors; installing a new metal storefront and signage at the

main entrance on Mariposa Street; adding new pedestrian entrances and infilling several windows on the north (rear) façade of the office wing; and adding new telescoping doors to the shops wing.

The tertiary and quaternary façades on the north and west where most alterations occurred are obscured behind walls, fencing, equipment, and street trees. The primary and secondary street façades along Mariposa and Hampshire streets, respectively, contain most of the character-defining features of the resource and remain largely intact from the period of significance. Although the type of buses served at Potrero Yard changed in 1949, the essential function of the building as a maintenance and operations facility for a major municipal transit agency has not changed. Additionally, while the interior has seen alterations such as upgrades to the restrooms to comply with the Americans with Disabilities Act, renovations to the conference and lunch rooms, and modifications to the heavy repair bays, the Potrero Trolley Coach Division Facility still maintains the feeling and association of an early 20th-Century transit facility. Thus, despite these alterations, the resource is still recognizable as an early 20th-Century streetcar barn, particularly when viewed from the corner of Mariposa and Hampshire streets. Therefore, the subject property retains sufficient integrity as an individual resource listed in the California Register.

Character-Defining Features

The planning department concurs with the list of character-defining features identified in the HRE, which are listed in **Table 3.B.1: Character-Defining Features of the Potrero Trolley Coach Division Facility**. See **Figures 3.B.1(a) and 3.B.1(b): Character-Defining Features of the Potrero Trolley Coach Division Facility**, pp. 3.B.15-3.B.16, for an illustration of the character-defining features of the site.

Table 3.B.1: Character-Defining Features of the Potrero Trolley Coach Division Facility

• Overall height and massing of the two-story office wing and the remaining portions of the original shops wing along Hampshire Street, including its flat roof.
• Fenestration pattern on office wing (Mariposa and Hampshire Streets only) consisting of large vehicular openings at the first floor and groups of three double-hung metal windows at the second-floor level.
• Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire streets, including re-entrant corner detailing, pilaster separating the vehicular openings and door hoods, molded intermediate cornice, continuous lug sill beneath the windows, shallow cornice, and medallion featuring original Muni logo. Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street.
• Remaining pedestrian door surround on Hampshire Street façade of office wing with inscription above.
• Remaining door trim on westernmost vehicular bay on Mariposa Street.
• Surviving double-hung, six-over-six, metal windows on office wing.
• Flagpole.

Source: San Francisco Planning Department, Historic Resources Evaluation Response, Part 1, 2500 Mariposa Street, September 25, 2020, p. 4 (see **EIR Appendix D-2**, San Francisco Planning Department, Historic Resources Evaluation Response, Part 1, 2500 Mariposa Street, September 25, 2020**)**.

California Register Eligibility Conclusion

The Showplace Square Survey, the HRE on the Potrero Trolley Coach Division Facility, and the planning department's HRER-Part I concur that the site is a historical resource under Criterion 1 (Events) and Criterion 3 (Architecture/Design/Construction). Based on the findings included in the planning department's HRER-Part I, the Potrero Trolley Coach Division Facility is individually eligible for listing in the California Register as a historic resource under Criterion 1 for its association with the earliest years of San Francisco's Municipal Railway, the United States' first publicly owned street railway; and under Criterion 3 because it embodies distinctive characteristics of a type (car barn); for its post-Earthquake period of construction; and as the work of master Michael M. O'Shaughnessy. The period of significance under Criterion 1 is 1915-1948 (the year of original construction to the year of conversion into an electric trolley coach maintenance and operations facility). The period of significance under Criterion 3 is 1924-1941.

As a property determined to be individually eligible for listing in the California Register, the property is considered a historical resource for the purposes of review under CEQA.

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Image 1: View northeast of office wing primary façade along Mariposa Street.

Image 2: View northwest of office wing primary façade along Mariposa Street (left), and secondary façade along Hampshire Street (right).

Image 3: View northwest of secondary façade along Hampshire Street. Note the change in parapet height where the office wing (left) meets the shops wing (right).

Image 4: View southwest of shops wing secondary façade along Hampshire Street. Photo taken from the corner of Hampshire Street and 17th Street.

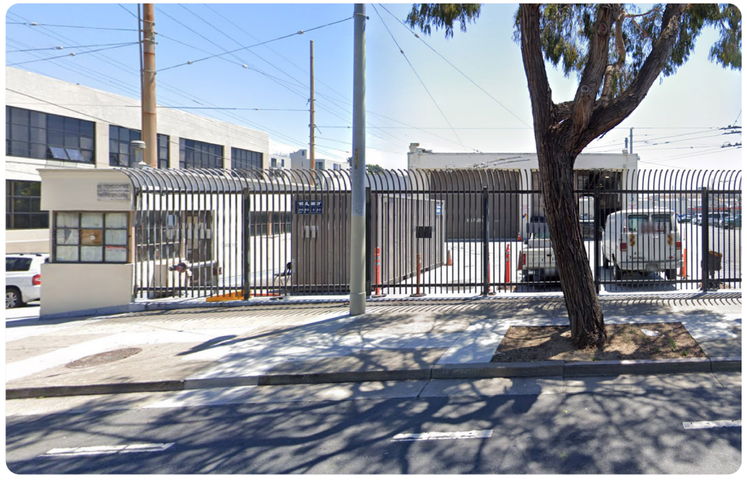
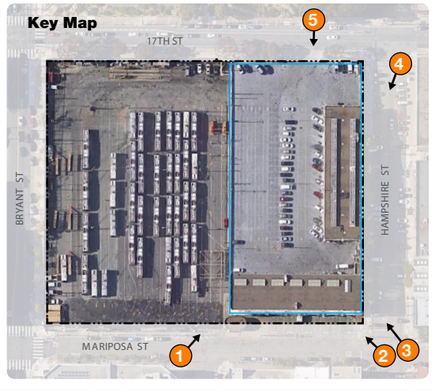


Image 5: View south of shops wing tertiary façade along 17th Street.



Character-Defining Features

- Overall height and massing of the two-story office wing and the remaining portions of the original shops wing along Hampshire Street, including its flat roof
- Fenestration pattern on office wing (Mariposa and Hampshire Streets only) consisting of large vehicular openings at the first floor and groups of three double-hung metal windows at the second-floor level
- Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire Streets, including re-entrant corner detailing, pilaster separating the vehicular openings and door hoods, molded intermediate cornice, continuous lug sill beneath the windows, shallow cornice, and medallion featuring original Muni logo. Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street
- Remaining pedestrian door surround on Hampshire Street façade of office wing with inscription above
- Remaining door trim on westernmost vehicular bay on Mariposa Street
- Surviving double-hung, six-over-six, metal windows on office wing
- Flagpole

Source: SITELAB urban studio

POTRERO YARD MODERNIZATION PROJECT
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FIGURE 3.B.1(a): CHARACTER-DEFINING FEATURES OF THE POTRERO TROLLEY COACH DIVISION FACILITY

Image 6: Detail view of office wing primary façade. Note character defining features including molded concrete and cement plaster ornament, fenestration pattern of groups of three double-hung metal windows, medallion featuring original Muni logo, and flagpole

Image 7: Detail view of office wing secondary façade. Note character-defining features including molded concrete and cement plaster ornament, reentrant corner detailing, double-hung metal windows, and pedestrian door surround.

Image 8: Detail view of office wing primary façade. Note character-defining features include remaining door trim of westernmost bay.

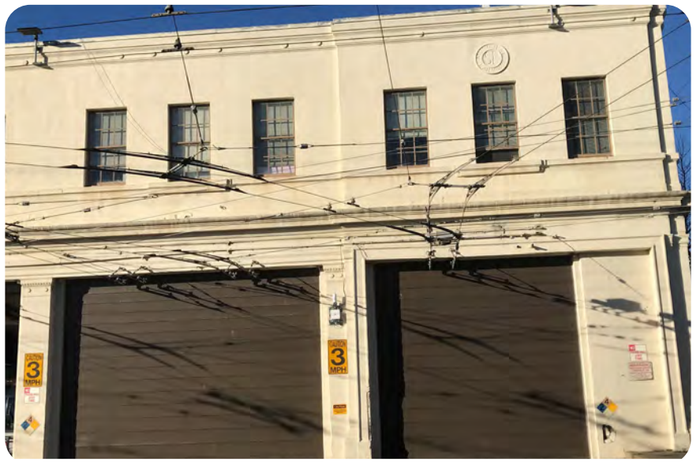
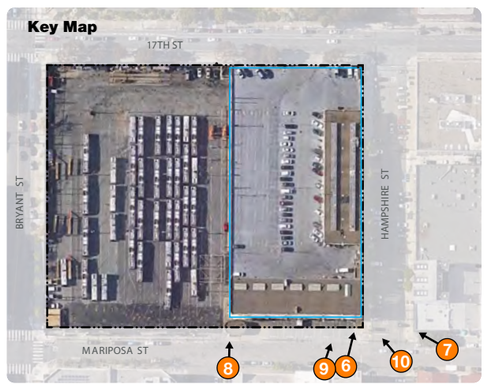


Image 9: Detail view of office wing primary façade. Note character-defining features include large vehicular openings, double-hung windows, and medallion featuring original Muni logo.

Image 10: Detail view of office wing's primary (Mariposa Street) and secondary façades (Hampshire Street). Note character-defining features include the fenestration pattern of groups of three double-hung metal windows at the second floor level with a continuous lug sill, large vehicular openings at the first floor, reentrant corner detailing, and the flagpole.



Character-Defining Features

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- Remaining pedestrian door surround on Hampshire Street façade of office wing with inscription above
- Remaining door trim on westernmost vehicular bay on Mariposa Street
- Surviving double-hung, six-over-six, metal windows on office wing
- Flagpole

Source: SITELAB urban studio; SWCA, 2021

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 3.B.1(b): CHARACTER-DEFINING FEATURES OF THE POTRERO TROLLEY COACH DIVISION FACILITY

NEARBY HISTORIC RESOURCES

Nearby historic resources include those that are within approximately 600 feet of the site (or about a block in each direction north to south and two blocks in each direction east to west).

As discussed above on p. 3.B.10, Kelley & VerPlanck Historical Resources Consulting prepared the Showplace Square Survey in conjunction with the planning department. The Showplace Square Survey area encompassed the historically industrial areas of Showplace Square/Potrero Hill and the Mission among other small contiguous areas. Within the irregular boundaries were 736 acres and 550 properties containing 526 buildings. The Showplace Square Survey studied and recorded all properties constructed before 1955.[11] The Showplace Square Survey was adopted by the Historic Preservation Commission in June 2011.[12]

The buildings described below were determined to be individual resources; all other buildings were determined not to be resources or were not age eligible at the time of the survey. Also described, although not a historic resource, is Franklin Square.

Additionally, the Showplace Square Survey resulted in the identification and documentation of one eligible historic district: the Showplace Square Heavy Timber and Streel-frame Brick Warehouse and Factory Historic District.[13] As described below in more detail, the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory District contains 16 discontiguous contributing properties and appears eligible for listing in the California Register under Criterion 1 (Events) for its association with the context of industrial employment in San Francisco between 1895 and 1955.[14]

Individual Resources

Lux School of Industrial Training (now the SGI Cultural Center) – 2450 17th Street

Lux School of Industrial Training is located directly northeast of the project site at 2450 17th Street. This four-story Renaissance Revival-style reinforced-concrete building was constructed in 1913

[11] Kelley & VerPlanck, Showplace Square Survey, San Francisco, California, Final (prepared for San Francisco Planning Department, October 2009), pp. 3-4.
[12] San Francisco Planning Department, Showplace Square/Northeast Mission Historic Resource Survey, *https://sfplanning.org/showplace-squarenortheast-mission-historic-resource-survey#about*, accessed November 6, 2020.
[13] Although the survey identified a second potential historic district, the Northeast Mission Industrial Employment District, the Historic Preservation Commission did not find this district to be eligible for listing in the California Register and as such it is not a historic resource under CEQA. DPR 523D Form, Northeast Mission - Showplace Square Industrial Employment Special Area, *https://default.sfplanning.org/Preservation/showplace_survey/DPR523D-ShowplaceIE-area.pdf*, accessed December 3, 2020.
[14] Kelley & VerPlanck, p. 105.

and is a highly intact former school building. The Showplace Square Survey assigned the property California Historical Resource Status Code 3S, indicating the property is individually eligible for listing in the National Register under Criterion A (Events) for its association with the "growth of interest in the education of women during the Progressive Era in San Francisco" and under Criterion C (Architecture) "as an architecturally outstanding building that possess the distinctive characteristics of a building type (institutional), period (post-1906), and method of construction (reinforced concrete with pressed brick and terra cotta façades).[15] The property was also surveyed as part of the 1976 Department of City Planning Architectural Quality Survey. Therefore, the department concludes the building is considered a historic resource for the purposes of CEQA review.

Leyser-Green Co. Building – 2401-2425 17th Street

The Leyser-Green Co. Building is located directly across Hampshire Street from the project site at 2401-2425 17th Street. This two-story American Commercial-style reinforced-concrete industrial building was constructed as a factory in 1909. The Showplace Square Survey assigned the property California Historical Resource Status Code 3CS, indicating the property is individually eligible for listing in the California Register under Criteria 1 (Events) and 3 (Architecture). Therefore, the department concludes the building is considered a historic resource for the purposes of CEQA review.

Verdi Club – 2424 Mariposa Street

The Verdi Club is located approximately half a block east of the project site at 2424 Mariposa Street. This two-story Art Deco-style reinforced-concrete building was constructed in 1936. The Showplace Square Survey assigned the property California Historical Resource Status Code 3CS, indicating the property is individually eligible for listing in the California Register under Criterion 1 (Events) "for its association with San Francisco's once-numerous and still influential Italian-American community" and under Criterion 3 (Architecture) "as an intact and unusual example of a social hall designed in the Art Deco style."[16] Therefore, the department concludes the building is considered a historic resource for the purposes of CEQA review.

Franklin Square

The Showplace Square Survey addressed two public parks: Franklin Square and Jackson Playground. Franklin Square is a landscaped open space directly north of the project site on a prominent serpentine rock outcrop bounded by concrete retaining walls. Originally a landscaped

[15] California Department of Parks and Recreation (DPR) series 523 forms, Lux School of Industrial Training – 2450 17th Street, p. 3.
[16] California Department of Parks and Recreation (DPR) series 523 forms, Verdi Club – 2424 Mariposa Street, p. 2.

Victorian park with large areas of grass, trees, and meandering paths, it was not fully completed until after the 1906 Earthquake. In 1984 a large soccer field was added. Aside from the concrete retaining walls and concrete stairs built at Bryant and 16th streets in 1911, Franklin Square does not retain historic fabric. The Showplace Square Survey assigned the property California Historical Resource Status Code 6Z, indicating the property is ineligible for listing in the California Register, and was determined to not be a resource.[17]

Historic Districts

Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory District

In the course of survey work for the Showplace Square Survey, Kelley & VerPlanck Historical Resources Consulting, LLC identified the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory historic district. The district consists of 18 properties, 16 of which are contributors. It is a discontiguous[18] district consisting of one group of buildings to the north of the Potrero Trolley Coach Division Facility and two groups to the northeast. The grouping to the north is located approximately two blocks north on the east side of Bryant Street, between 15th and Division streets. A small extension of the potential district crosses west of Bryant Street on the north side of 15th Street. The first group of buildings to the northeast is located one block to the north and one block to the east, primarily on the block bordered on the west by Potrero Avenue, on the east by Utah Street, on the south by 16th Street, and on the north by 15th Street. A small extension of the district crosses east of Utah Street on the north side of 15th Street. The second, and final, group of buildings to the northeast is located one block to the north and five blocks to the east. This grouping consists of northern and southern sections. The northern section is bordered on the west by Vermont Street, on the east by Kansas Street, on the south by Alameda Street, and on the north by Division Street. The southern section is bordered on the west by Kansas Street, on the east by Rhode Island Street, on the south by 16th Street, and on the north by Alameda Street.

The Showplace Square Survey found the district to be eligible for listing in the California Register under Criterion 3 (Architecture/Design/Construction) as "San Francisco's most important concentration of large heavy timber and streel frame American Commercial style industrial buildings."[19] As a concrete transit facility, the Potrero Trolley Coach Division Facility does not

[17] Kelley & VerPlanck, p. 98, and California Department of Parks and Recreation (DPR) series 523 forms, Franklin Square – 2851 16th Street, p. 1.

[18] A discontiguous historic district is a district comprised of contributing resources (or groups of resources) that may be separated from each other by other buildings (or groups of buildings) that are not part of the district. Discontigous districts can be citywide and based on a resource type such as post-1906 Earthquake temporary structures and public libraries or in discrete but nearby locations such as the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory District.

[19] California Department of Parks and Recreation (DPR) series 523 forms, Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory District, p. 1.

share the same material, architectural vocabulary, or function of contributing buildings within this identified historic district, nor is it within close proximity to the district, and as such it is not considered a contributor to this historic district.

REGULATORY FRAMEWORK

This subsection describes the federal, state, and local laws and regulations that pertain to the identification and regulation of historic architectural resources.

FEDERAL

National Register of Historic Places

The National Register of Historic Places is the nation's master inventory of cultural resources worthy of preservation. It is administered by the National Park Service, which is represented at the state level by the State Historic Preservation Officer. The National Register includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archeological, or cultural significance at the federal, state, or local level. Resources that are listed in or have been found by the State Historic Preservation Officer to be eligible for listing in the National Register are called historic properties. The National Register provides four evaluative criteria to determine eligibility of a resource:

> The quality of significance in American history, architecture, archaeology and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and:
>
> A. that are associated with events that have made a significant contribution to the broad patterns of history; or
>
> B. that are associated with the lives of persons significant in our past; or
>
> C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. that have yielded or may likely yield information important in prehistory or history.[20]

Although there are exceptions, certain kinds of resources are not usually considered for listing in the National Register. These include religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties that have achieved significance within the past 50 years.

[20] Code of Federal Regulations, Title 36, Chapter 1, Part 60, Section 60.4.

Integrity

In addition to qualifying for listing under at least one of the National Register criteria, a property must possess sufficient integrity to be considered eligible for listing in the National Register. According to the National Register Bulletin: How to Apply the National Register Criteria for Evaluation, integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." The National Register Bulletin defines seven characteristics of integrity, as follows:

Location is the place where the historic property was constructed.

Design is the combination of elements that create the form, plans, space, structure, and style of the property.

Setting addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the buildings.

Materials refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property.

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history.

Feeling is the property's expression of the aesthetic or historic sense of a particular period of time.

Association is the direct link between an important historic event or person and an historic property.

The Secretary of the Interior's Standards for the Treatment of Historic Properties

The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (the Secretary's Standards) were published in 1995 and codified as 36 Code of Federal Regulations 68.[21,22] Neither technical nor prescriptive, these standards are intended to promote responsible preservation practices that help protect irreplaceable cultural resources. The Secretary's Standards consist of 10 basic principles created to help preserve the distinctive character of an historic building and its

[21] U. S. Department of the Interior, National Park Service (Kay D. Weeks and Anne E. Grimmer), The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstruction of Historic Buildings, 1995, updated 2017, *https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf,* and National Park Service Technical Preservation Services, Four Approaches to the Treatment of Historic Properties, *https://www.nps.gov/tps/standards/four-treatments.htm*, accessed May 5, 2021.

[22] Treatments are defined as follows: "Preservation" acknowledges a resource as a document of its history over time and emphasizes stabilization, maintenance, and repair of existing historic fabric. "Rehabilitation" is the most widely used standard; while also incorporating the retention of features that convey historic character, "Rehabilitation" also accommodates alterations and additions to facilitate continuing or new uses. "Restoration" involves the retention and replacement from a specific period of significance. "Reconstruction," the least-used treatment, provides a basis for re-creating a missing resource.

site while allowing for reasonable changes to meet new needs. The preamble to the Secretary's Standards states that they "are to be applied to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility." The standards for rehabilitation of a historic resource are as follows:

Standard 1: A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

Standard 2: The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

Standard 3: Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

Standard 4: Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

Standard 5: Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

Standard 6: Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

Standard 7: Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

Standard 8: Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

Standard 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

Standard 10: New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

STATE

Definition of Historical Resources under CEQA

CEQA Guidelines section 15064.5(a), in Title 14 of the California Code of Regulations, defines a "historical resource" as:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources.

(2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources.

(4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

Therefore, under the CEQA Guidelines, even if a resource is not included on any local, state, or federal register, or identified in a qualifying historical resources survey, a lead agency may still determine that any resource is a historical resource for the purposes of CEQA if there is substantial evidence supporting such a determination. A lead agency must consider a resource to be historically significant if it finds that the resource meets the criteria for listing in the California Register.

California Register of Historical Resources Criteria

The California Register is the authoritative guide to historical and archeological resources that are significant within the context of California's history. Criteria for eligibility for inclusion in the California Register are based on, and therefore correspond to, National Register criteria for listing. A resource that meets at least one of the eligibility criteria for inclusion in the California Register is considered a historical resource for the purposes of CEQA. A resource is eligible for listing in the California Register if it:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage (Events);

(2) Is associated with the lives of persons important in our past (Persons);

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values (Design/Construction); or

(4) Has yielded, or may be likely to yield, information important in prehistory or history (Information Potential).[23]

National Park Service guidance on evaluating the integrity of resources often informs the determination of eligibility under the California Register.

LOCAL

San Francisco Planning Code Section 101.1: General Plan Consistency and Implementation (Priority Policies)

San Francisco Planning Code section 101.1 is generally applicable to the proposed project. It requires that the City find that the proposed project is consistent on balance with eight master plan priority policies. Priority Policy 7 is relevant to historical resources and establishes a priority policy "that landmarks and historic buildings be preserved."

San Francisco General Plan

The Urban Design Element of the San Francisco General Plan includes the following policies related to historic preservation:

Policy 2.4: Preserve notable landmarks and areas of historic, architectural or aesthetic value, and promote the preservation of other buildings and features that provide continuity with past development.

Policy 2.5: Use care in remodeling of older buildings, in order to enhance rather than weaken the original character of such buildings.

San Francisco Planning Department, CEQA Review Procedures for Historical Resources

The planning department prepared the *CEQA Review Procedures for Historic Resources* to provide guidance in determining whether a resource is considered a historical resource as defined by CEQA.[24] Three categories of properties are defined:

Category A. Category A is made up of Categories A.1 and A.2:

- Category A.1. Resources listed in or formally determined to be eligible for the California Register.
- Category A.2. Resources listed in adopted local registers, or properties that appear eligible, or may become eligible, for the California Register.

Category B. Properties requiring further consultation and review.

[23] Public Resources Code section 5024.1.
[24] San Francisco Planning Department, Preservation Bulletin No. 16, CEQA Review Procedures for Historic Resources, Draft, March 31, 2008.

Category C. Properties determined not to be historical resources, or properties for which the City has no information indicating that the property is an historical resource.

To determine if a property is eligible as a historical resource for the purposes of CEQA, the planning department (lead agency) requires an evaluation of a property's individual significance for listing in the California Register, as well as an examination of a property's relationship to any eligible historic district.

To assess impacts within historic districts, the planning department examines several factors including, but not limited to, size and significance of a historic district, number and location of contributing features/non-contributing features, district integrity, district boundaries, and the proposed project. Assessments within historic districts are examined on a case-by-case basis, due to the wide variety and unique nature of historical resources.

San Francisco Public Works Standard Construction Measures

As discussed in **EIR Chapter 2, Project Description**, pp. 2.49, San Francisco Public Works (public works) standard construction measures (SCMs) would apply to the proposed project or project variants (see **Table 2.3: San Francisco Public Works Standard Construction Measures**, p. 2.50, and **EIR Appendix C**). The SFMTA and a private project co-sponsor (or project sponsor team) will implement public works' SCMs as part of the proposed project or project variants, including the SCM for cultural resources (**SCM #9**). **SCM #9, Cultural Resources**, establishes procedures related to construction of certain City projects that have the potential to alter cultural resources.

The component of **SCM #9** applicable to archaeological resources is discussed in the initial study (see topic E.4 in **EIR Appendix B**). The component of **SCM #9** applicable to historic architectural resources requires a project sponsor to consult with planning department staff to determine whether a Historic Resource Evaluation will be required for projects with the potential to alter buildings, structures, or landscape features. As discussed above, an HRE has already been prepared for the proposed project and the evaluation identified the subject property as an individual historic resource.

If construction activities take place in proximity to a building, structure, or landscape feature identified as a significant historical resource, **SCM #9** also specifies that a project sponsor will develop a Construction Best Practices for Historical Resources Plan and Construction Monitoring for Historical Resources Program, in consultation with planning department staff. Implementation of the protective measures outlined in these plans, such as the use of protective barriers during construction, is intended to avoid inadvertent impacts to historic buildings, structures, and landscape features near the project site or the construction staging areas for the various equipment to be used for demolition, excavation, and building construction.

SCM #9, Cultural Resources, also addresses issues related to vibration produced during construction occurring adjacent to historic architectural resources which are susceptible to vibration. The SCM specifies that a project sponsor will consult with planning department staff to determine whether historic architectural resources would be located adjacent to project construction activities such that they would be susceptible to damage caused by construction-related vibration. In such cases, vibration control procedures would be incorporated into the construction contract and require the contractor to prepare a vibration monitoring plan and vibration control plan. The vibration control plan must identify vibration-sensitive resources, standards for vibration criteria that are not to be exceeded by construction activities, real-time activity monitoring to identify when vibration levels approach the predetermined value at which damage could occur, requirements to immediately cease construction activities when vibration levels reach levels at which damage could occur, and procedures for restoring resources to their pre-construction condition should damage occur as a result of construction-related vibration. A copy of the vibration control procedures that must be incorporated into such contracts in accordance with public works requirements is included in **EIR Appendix C** (see Vibration Control Procedures for Inclusion in Construction Contracts following Attachment H).

The vibration control procedures in **SCM #9, Cultural Resources**, which require pre-construction condition assessments to identify buildings that are vulnerable to vibrational damage, vibration monitoring during construction, and requirements to restore structures to pre-construction conditions if vibration-related damage were to occur, would avoid impacts on such resources. There are no onsite buildings or structures that would be retained and no immediately adjacent properties; therefore, the historic resources analysis does not include a detailed discussion of construction-related vibrational damage to structures. The vibration-related component of **SCM #9, Cultural Resources**, and vibration-related impacts are discussed in detail in **EIR Section 3.D, Noise and Vibration**, pp. 3.D.22-3.D.23 and pp. 3.D.44-3.D.47, respectively. Because the maintenance and operations building would not be retained and reused, there would be no construction-related vibration effects on adjacent buildings on the project site. As discussed in **EIR Section 3.D**, construction activities associated with project implementation would be located at least 66 feet from the closest structures and at least 80 feet from the closest off-site historic resource (the Leyser-Green Co. Building at 2401-2425 17th Street). The distance of the off-site historic resources from the construction activities would avoid the potential for vibrational damage to existing buildings. However, due to the size of project, the amounts and types of construction activities, and the presence of significant historical resources in the immediate area (although at distance from construction activities), all components of public work's **SCM #9 Cultural Resources**, including construction activities monitoring plan to protect historical resources and vibration control procedures, would be incorporated into the construction contracts for the proposed project or project variants.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERION

The planning department determines the significance of impacts in this analysis consistent with the environmental checklist in Appendix G of the State CEQA Guidelines. For the purposes of this analysis, the department used the following applicable criterion to determine whether implementing the proposed project or project variants would result in a significant impact related to historic architectural resources. Implementation of a project would have a significant effect related to historic architectural resources if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code.

The CEQA Guidelines (section 15064.5(b)) establish the criteria for assessing a significant environmental impact on historical resources. They state, "[a] project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." The CEQA Guidelines define "substantial adverse change" as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (section 15064.5(b)(1)).

CEQA Guidelines section 15064.5(b)(2)(C) provides the significance threshold for evaluating impacts on historical resources under CEQA.

> The significance of an historical resource is materially impaired when a project [d]emolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

APPROACH TO ANALYSIS

Project Features

The proposed project would demolish the existing maintenance and operations building and bus storage yard on the project site and would replace them with a new building. The new building would be approximately 75 to 150 feet tall and up to 1,300,000 gross square feet. The new building would cover the entire site between 17th Street to the north, Mariposa Street to the south, Bryant Street to the west, and Hampshire Street to the east, except for a 5-foot-wide planting strip along 17th Street.

The proposed project includes four variants, each with a minor change to an element of the project.

- **Emergency Exit Relocation Variant:** Relocation of the proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street.
- **Joint Development Lobby Relocation Variant:** Relocation of joint development lobby off Mariposa Street to Hampshire Street.
- **Active 17th Street Variant:** Site program revision to include active uses along 17th Street frontage, including internal relocation of ramps from the north portion of the site to a more southerly location.
- **Employee and Family Support Variant:** Site program revision to include childcare, or related use, in a portion of the space identified in the proposed project for ground-floor commercial use.

The analysis of the proposed project also applies to the project variants because the variants are minor relocations and site programming changes that do not affect the demolition or construction program, i.e., under the proposed project and each variant, all character-defining features would be removed. Therefore, these project variants would not change the historic resources analysis detailed for the proposed project. **EIR Chapter 2, Project Description**, pp. 2.56-2.58, presents a detailed description of each variant.

As discussed in the "Environmental Setting" subsection, pp. 3.B.2-3.B.20, based on background research and analysis prepared by qualified architectural historians, and with independent review and concurrence from the department, the planning department has determined that the Potrero Trolley Coach Division Facility meets the eligibility criteria for inclusion in the California Register under Criterion 1 (Events) and Criterion 3 (Architecture/Design/Construction). As such, it is considered a historical resource under CEQA Guidelines section 15064.5(a)(3). The HRER Part I identifies the character-defining features of the resource that contribute to and convey its historic and architectural significance and that justify the resource's eligibility for inclusion in the California Register.

As discussed above under "Significance Criterion," a project's impact on a historical resource is evaluated under CEQA's "material impairment" standard. Under that standard, a significant impact on a historical resource results when a project demolishes or materially alters the resource's physical characteristics that justify its eligibility for inclusion in the California Register. Generally, if a project follows the Secretary's Standards (as listed on pp. 3.B.21-3.B.22 under "Regulatory Framework"), the project would not cause significant impacts (CEQA Guidelines section 15064.5 (b)(3)).

Additionally, this analysis assumes that the construction contracts include all public works SCMs, (see discussion above on pp. 3.B.25-3.B.26 and **EIR Appendix C**).

IMPACT EVALUATION

Impact CR-1: The proposed project or project variants would cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5 of the CEQA Guidelines. ***(Significant and Unavoidable with Mitigation)***

The Potrero Trolley Coach Division Facility, built in 1915 and remodeled in 1924 and again in 1948-1949, is eligible for listing in the California Register as an individual property under Criterion 1 for its association with the earliest years of San Francisco's Municipal Railway, the United States' first publicly owned street railway, and under Criterion 3 because it embodies distinctive characteristics of a type—car barn, for its post-Earthquake period of construction, and as the work of master Michael M. O'Shaughnessy. As such, the property is considered a "historical resource" for the purposes of CEQA.

The proposed project or project variants would demolish the entire yard and building and redevelop the whole site with an approximately 1,300,000-gross-square-foot building that rises between 75 to 150 feet in height, including a basement level. The character-defining features presented in **Table 3.B.1** on p. 3.B.13 are the distinctive qualities and characteristics of the existing maintenance and operations building that convey the property's historic and architectural significance and justify its eligibility for listing in the California Register. The demolition under the proposed project or project variants would eliminate all the character-defining features that contribute to and convey the historic and architectural significance of the project site as a post-Earthquake reinforced concrete car barn designed by master Michael M. O'Shaughnessy.

For these reasons, the proposed project or project variants would materially alter the physical characteristics of the Potrero Trolley Coach Division Facility that convey its historic significance and that justify its inclusion in the California Register. As such, the proposed project or project variants would cause a substantial adverse impact on the Potrero Trolley Coach Division Facility, a historical resource, and this would be a significant impact.

Implementation of **Mitigation Measures M-CR-1a: Documentation of Historical Resource**, **M-CR-1b: Salvage Plan**, **M-CR-1c: Interpretation of the Historical Resource**, and **M-CR-1d: Oral Histories**, shown below, would lessen the impact of the proposed demolition and new construction by documenting and presenting the complex's history and character as a car barn from the earliest years of San Francisco's Municipal Railway. However, implementation of these mitigation measures would not reduce this impact to a less-than-significant level.

> **Mitigation Measure M-CR-1a: Documentation of Historical Resource (HRER Part II, Mitigation Measure 1)**
>
> Prior to issuance of a demolition permit, the project sponsor team shall undertake Historic American Building/Historic American Landscape Survey-like (HABS/HALS-like) documentation of the building features. The documentation shall be undertaken by a professional who meets the Secretary of the Interior's Professional Qualifications

Standards for Architectural History, History, or Architecture (as appropriate) to prepare written and photographic documentation of the Potrero Trolley Coach Division Facility. The specific scope of the documentation shall be reviewed and approved by the Planning Department but shall include the following elements:

Measured Drawings – A set of measured drawings shall be prepared that depict the existing size, scale, and dimension of the historic resource. Planning Department staff will accept the original architectural drawings or an as-built set of architectural drawings (e.g., plans, sections, elevations). Planning Department staff will assist the consultant in determining the appropriate level of measured drawings.

Historic American Buildings/Historic American Landscape Survey-Level Photographs – Either Historic American Buildings/Historic American Landscape Survey (HABS/HALS) standard large-format or digital photography shall be used. The scope of the digital photographs shall be reviewed by Planning Department staff for concurrence, and all digital photography shall be conducted according to the latest National Park Service (NPS) standards. The photography shall be undertaken by a qualified professional with demonstrated experience in HABS/HALS photography. Photograph views for the data set shall include contextual views; views of each side of the building and interior views, including any original interior features, where possible; oblique views of the building; and detail views of character-defining features.

All views shall be referenced on a photographic key. This photographic key shall be on a map of the property and shall show the photograph number with an arrow to indicate the direction of the view. Historic photographs shall also be collected, reproduced, and included in the data set.

HABS/HALS Historical Report – A written historical narrative and report shall be provided in accordance with the HABS/HALS Historical Report Guidelines. The written history shall follow an outline format that begins with a statement of significance supported by the development of the architectural and historical context in which the structure was built and subsequently evolved. The report shall also include architectural description and bibliographic information.

Video Recordation (HRER Part II, Mitigation Measure 3) – Video recordation shall be undertaken before demolition or site permits are issued. The project sponsor team shall undertake video documentation of the affected historical resource and its setting. The documentation shall be conducted by a professional videographer, one with experience recording architectural resources. The documentation shall be narrated by a qualified professional who meets the standards for history, architectural history, or architecture (as appropriate) set forth by the Secretary of the Interior's Professional Qualification Standards (36 Code of Federal Regulations Part 61). The documentation shall include as much information as possible—using visuals in combination with narration—about the materials, construction methods, current condition, historic use, and historic context of the historical resource. This mitigation measure would supplement the traditional HABS/HALS documentation, and would enhance the collection of reference materials that would be available to the public and inform future research.

Softcover Book – A Print-on-Demand softcover book shall be produced that includes the content from the historical report, historical photographs, HABS/HALS photography, measured drawings, and field notes. The Print-on-Demand book shall be made available to the public for distribution.

The project sponsor team shall transmit such documentation to the History Room of the San Francisco Public Library, San Francisco Architectural Heritage, the Planning Department, and the Northwest Information Center. The HABS/HALS documentation scope will determine the requested documentation type for each facility, and the project sponsor team will conduct outreach to identify other interested groups. All documentation will be reviewed and approved by the Planning Department's staff before any demolition or site permit is granted for the affected historical resource.

Mitigation Measure M-CR-1b: Salvage Plan (HRER Part II, Mitigation Measure 2)

Prior to any demolition that would remove character-defining features, the project sponsor team shall consult with the planning department as to whether any such features may be salvaged, in whole or in part, during demolition/alteration. The project sponsor team shall make a good faith effort to salvage materials of historical interest to be utilized as part of the interpretative program.

Mitigation Measure M-CR-1c: Interpretation of the Historical Resource (HRER Part II, Mitigation Measure 4)

The project sponsor team shall facilitate the development of an interpretive program focused on the history of the project site. The interpretive program should be developed and implemented by a qualified professional with demonstrated experience in displaying information and graphics to the public in a visually interesting manner, such as a museum or exhibit curator. This program shall be initially outlined in a proposal for an interpretive plan subject to review and approval by Planning Department staff. The proposal shall include the proposed format and the publicly-accessible location of the interpretive content, as well as high-quality graphics and written narratives. The proposal prepared by the qualified consultant describing the general parameters of the interpretive program shall be approved by Planning Department staff prior to issuance of the architectural addendum to the site permit. The detailed content, media, and other characteristics of such an interpretive program shall be approved by Planning Department staff prior to issuance of a Temporary Certificate of Occupancy.

The interpretative program shall include but not be limited to the installation of permanent on-site interpretive displays or screens in publicly accessible locations. Historical photographs, including some of the large-format photographs required by Mitigation Measure M-CR-1a, may be used to illustrate the site's history. The oral history program required by Mitigation Measure M-CR-1d will also inform the interpretative program.

The primary goal is to educate visitors and future residents about the property's historical themes, associations, and lost contributing features within broader historical, social, and physical landscape contexts. These themes would include but not be limited to the subject property's historic significance for its association with the earliest years of San Francisco's Municipal Railway, the United States' first publicly owned street railway and for its distinctive characteristics as a car barn, for its post-Earthquake period of construction, and as the work of master Michael M. O'Shaughnessy.

Mitigation Measure M-CR-1d: Oral Histories (HRER Part II, Mitigation Measure 5)

The project sponsor team shall undertake an oral history project on the resource that may include interviews of people such as former employees. The project shall be conducted by a professional historian in conformance with the Oral History Association's Principles and Best Practices (https://www.oralhistory.org/principles-and-best-practices-revised-2018/).

> In addition to transcripts of the interviews, the oral history project shall include a narrative project summary report containing an introduction to the project, a methodology description, and brief summaries of each conducted interview. Copies of the completed oral history project shall be submitted to the San Francisco Public Library, Planning Department, and other interested historical institutions. The oral history project shall also be incorporated into the interpretative program.

Because the identified mitigation measures would not reduce the impact to a less-than-significant level, preservation alternatives have been identified. **EIR Chapter 5, Alternatives**, presents a range of alternatives that would meet most of the project's basic and additional objectives and could avoid or substantially lessen significant effects of demolition under the proposed project or project variants.

Impact CR-2: Construction of the proposed project or project variants would not materially alter, in an adverse manner, the physical characteristics of any off-site historical resource that justifies its inclusion in the California Register of Historical Resources. ***(Less than Significant)***

As discussed under "Nearby Historic Resources" on pp. 3.B.17-3.B.20, there are several historic resources in the immediate vicinity of the project site. The closest individual historic resource is the Leyser-Green Co. Building at 2401-2425 17th Street, approximately 80 feet to the east across Hampshire Street. Approximately 100 feet northeast across 17th Street is the Lux School of Industrial Training at 2450 17th Street. Lastly, the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory Historic District consists of the three subparts, with the closest approximately 600 feet to the north and east of the project site. There are no historical resources immediately adjacent to the project site, i.e., historical resources that share a property line.

Direct project-related impacts that could result in changes to the physical characteristics of off-site historical resources are related to construction activities and distance from the source of the construction activity. As noted, the existing historic resource on the site would be demolished and there are no immediately adjacent historic resources. Construction activities would be limited to the project site with laydown areas and other construction staging occurring in the northside parking lane and westbound travel lane of Mariposa Street and on Hampshire Street. Construction-related damage would be avoided because of the inclusion of public works' **SCM #9, Cultural Resources**, in the proposed project or project variants. Furthermore, the historic architectural resources in the immediate vicinity are located at distances that would not result in damage from construction activities or construction-related vibration. As stated above on pp. 3.B.25-3.B.26, the project sponsor team would require construction contractors to adhere to public work's **SCM #9, Cultural Resources**, including vibration control procedures, during construction of the project. These procedures require the identification of all resources that could be affected by construction activities including construction-related vibration; real-time monitoring to avoid exceedance of the vibration threshold at which damage could occur, as determined for each resource; cessation of construction

activities if that vibration threshold is reached; and procedures to restore resources to their pre-construction condition should they be damaged as a result of construction activities including construction-related vibration. As a result, the application of **SCM #9**, **Cultural Resources**, and vibration control procedures would avoid damage to historical resources in the immediate project vicinity, and the impact would be less than significant. **EIR Section 3.D, Noise and Vibration**, pp. 3.D.44-3.D.47, describes construction-related vibration impacts of the proposed project or project variants as they relate to the operation of sensitive equipment.

Despite their proximity to the project site, the identified off-site historic resources have no contextual or architectural relationship with the Potrero Yard Trolley Coach Division Facility. The subject property is not a contributor to, nor is it within the general vicinity of, the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory Historic District. Because the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory Historic District consists of discontiguous buildings within the general area rather than a cohesive collection of contiguous contributors that have an intact visual and spatial connection with each other, the demolition of a non-contributing building and new construction outside the general vicinity of the historic district does not have the potential to indirectly impact the significance of this historic district. Thus, the demolition of the existing historic resource under the proposed project or project variants and the new development that would take its place would have no potential to impact that eligible historic district, either directly through the removal of a contributing structure or indirectly through the introduction of a new structure within the district that would adversely alter the visual or spatial relationships of the district characteristics that justify its listing on the California Register.

Additionally, while the Potrero Trolley Coach Division Facility and the Lux School of Industrial Training were developed within a few years of each other and are both generally designed in the Renaissance Revival style, the Potrero Trolley Coach Division Facility is more utilitarian in design. In contrast, the Lux School is a more elaborate representation of the style, exhibiting a variety of materials and architectural details. Lastly, the portion of the project site that has visual or spatial connections with the Lux School consists primarily of a parking deck and the 1924 addition of the maintenance shops wing along Hampshire Street, which exhibits minimal architectural detail compared to the primary façade on Mariposa Street. Therefore, the Potrero Trolley Coach Division Facility and the Lux School do not share a contextual or architectural relationship, and demolition of the Potrero Trolley Coach Division Facility would not have an impact on the historic significance of the Lux School.

For these reasons, the proposed project or project variants would not demolish or materially alter in an adverse manner the physical characteristics of these nearby historical or potentially historical resources that convey their historical significance and that justify their eligibility for inclusion in the California Register. No mitigation measures are necessary.

CUMULATIVE IMPACTS

Impact C-CR-1: The proposed project or project variants, in combination with cumulative projects, would not materially alter, in an adverse manner, the physical characteristics of historical resources that justify their eligibility for inclusion in the California Register of Historical Resources, resulting in a cumulative impact. ***(Less than Significant)***

Cumulative projects are identified in **Table 3.A.1: Cumulative Projects**, on pp. 3.A.7-3.A.8, and in **Figure 3.A.1: Cumulative Projects**, on p. 3.A.9. The only cumulative project in the immediate vicinity of the site is 1850 Bryant Street; all other projects are more than a block away. None of the listed cumulative projects include the demolition of a historical resource. The impacts of cumulative projects on identified historical resources in the vicinity of the project site would not combine with impacts of the proposed project. The significance of the Potrero Trolley Coach Division Facility is not premised on it possessing an intact and cohesive visual or functional relationship with nearby properties. Likewise, and reciprocally, the significance of nearby offsite historical resources is not premised on their having an intact and cohesive visual or functional relationship with the project site. As such, the impact of the proposed project or project variants on the significance of the Potrero Trolley Coach Division Facility historical resource is independent of the impacts of nearby cumulative projects on the significance of nearby historical resources. Such impacts would not combine to result in a significant cumulative impact.

For these reasons, the impact of the proposed project or project variants on historical resources would not combine with those of cumulative projects to result in a significant cumulative impact on historical resources. No mitigation measures are required.

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C. TRANSPORTATION AND CIRCULATION

INTRODUCTION

EIR Section 3.C, Transportation and Circulation, describes existing transportation and circulation conditions in the study area and analyzes potential project-level and cumulative impacts on transportation and circulation during construction and operation of the proposed project or project variants. Transportation and circulation topics consist of walking, bicycling, driving hazards, public transit, emergency access, vehicle miles traveled, and loading. Supporting detailed technical information is included in **EIR Appendix E, Transportation Supporting Information**.

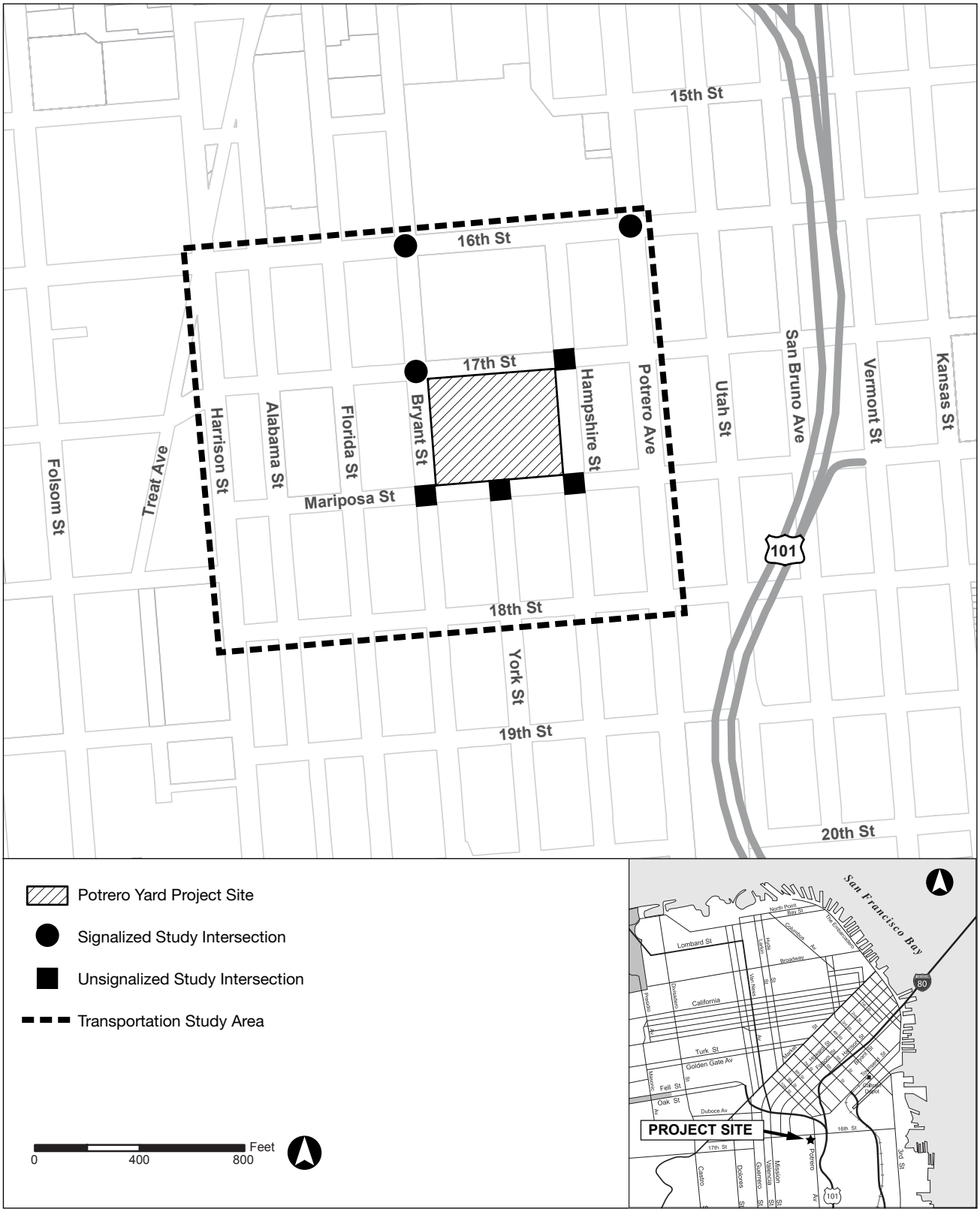
Issues identified in response to the Notice of Preparation (NOP) of an EIR and Notice of Public Scoping Meeting (**EIR Appendix A**) related to the proposed project's physical environmental impacts were considered in preparing this analysis. The San Francisco Planning Department (planning department) received comments related to transportation and circulation that focused on project transportation infrastructure upgrades, project travel demand, pedestrian and bicycle safety and accessibility, and vehicle parking (see **EIR Chapter 1, Introduction**, pp. 1.3-1.5).

EXISTING CONDITIONS

The transportation study area encompasses those locations where the project could affect transportation and circulation and is generally bounded by 16th Street to the north, Harrison Street to the west, 18th Street to the south, and Potrero Avenue to the east. **Figure 3.C.1: Transportation Study Area** shows the location of the project site, the boundaries of the transportation study area, and the study intersections.

REGIONAL AND LOCAL ROADWAYS

The closest regional roadways to the project site, including on- and off-ramps, are described below. The existing local roadways in the transportation study area are also described, including their geographic extent and their San Francisco General Plan (general plan), Better Streets Plan, Key Walking Street, and High Injury Network designations. For the existing streets adjacent to the project site, the width of the roadway, including travel lanes, and any potential or observed vehicle-to-vehicle hazardous conditions are noted. Information on the number of vehicles on roadway segments in the vicinity of the proposed project site is presented. Counts of buses and other vehicles and people walking and bicycling within the transportation study area were conducted in May 2018 and February 2020, while the description of transportation conditions near the project site is based on field surveys and observations conducted on multiple days in May 2018 and February and March 2020. All of the data collection occurred prior to the onset of changes resulting from the COVID-19 pandemic (e.g., prior to reductions in public transit service and peak period trips by all ways of travel).



Source: Fehr & Peers/LCW Consulting, 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 3.C.1: TRANSPORTATION STUDY AREA

Regional Roadways

U.S. Highways

U.S. Highway 101 (U.S. 101) is generally a north-south freeway, connecting San Francisco with the Peninsula and beyond to the south and Marin County and beyond to the north. It connects with **Interstate 80** (I-80) in the South of Market area of San Francisco, approximately 0.4 mile north of the project site. I-80 provides access to the East Bay and points farther east via the San Francisco-Oakland Bay Bridge. Between I-80 and the San Francisco city and county line, U.S. 101 is an eight- to 10-lane (total both ways) limited-access freeway. In the vicinity of the project site, northbound access from U.S. 101 is provided via an off-ramp at Vermont Street/Mariposa Street; trucks weighing more than 3 tons are prohibited from using the Vermont Street off-ramp. The on-ramp at Bryant Street at 10th Street provides access to southbound U.S. 101.

Interstate 280 (I-280) is a generally north-south freeway that connects San Francisco with the Peninsula and the South Bay. I-280 has an interchange with U.S. 101 approximately 1 mile south of the project site. I-280 terminates in San Francisco at surface streets in the South of Market/Mission Bay areas. Near the project site, I-280 is a six- to eight-lane facility (total both ways). The closest access to and from south I-280 is located at Mariposa Street/Owens Street, which is about 1 mile east of the project site.

Local Roadways

This section describes the existing local roadway system in the vicinity of the project site, including the general plan roadway designation, the number of travel lanes, vehicular traffic flow direction, and bicycle facilities.[1]

Sixteenth Street is an east-west arterial that runs between Terry A. Francois Boulevard to the east and Castro Street to the west. Between Third and Owens streets, 16th Street has one travel lane and one transit-only lane each way, with left-turn-only lanes provided at all intersections. Between Owens Street and Potrero Avenue, 16th Street has one travel lane and one transit-only lane each way and left turns are not permitted at any intersection in this 0.7-mile segment of 16th Street.

[1] City road designations within the San Francisco General Plan include the following (listed in the order of potential vehicle capacity): freeways, major arterials, transit conflict streets, secondary arterials, recreational streets, collector streets, and local streets. Each of these roadways has a different potential capacity for mixed-flow traffic and changes that might alter traffic patterns on the given roadway. The general plan also identifies certain Transit Preferential Streets from among the City's various roadways, each of which is identified as a Primary Transit Street-Transit Oriented, Primary Transit Street-Transit Important, or Secondary Transit Street. The Pedestrian Network classifies streets throughout the City. It identifies streets that have been developed primarily for use by people walking and includes the Citywide Pedestrian Network Streets and Neighborhood Pedestrian Streets. City and County of San Francisco, San Francisco General Plan, 2007, Transportation Element, *http://generalplan.sfplanning.org/I4_Transportation.htm#TRA_REG_5_4*, accessed May 5, 2021.

Between Potrero Avenue and Bryant Street, 16th Street currently has two mixed-flow travel lanes each way (i.e., no transit-only lanes). Sixteenth Street is designated in the general plan as a Primary Transit Oriented Preferential Street between De Haro and Church streets and as a Neighborhood Commercial Pedestrian Street between Bryant and Church streets. Sixteenth Street is also designated as a Key Walking Street[2] and part of the Vision Zero High Injury Network.[3]

Seventeenth Street runs east-west between Pennsylvania Street to the east and Stanyan Street to the west. In the vicinity of the project site, 17th Street has one travel lane in each direction. Bicycle lanes are provided both ways between Mississippi/Seventh streets in Mission Bay and Eureka Street in the Castro. Seventeenth Street is part of the Vision Zero High Injury Network.

Adjacent to the project site, the 17th Street roadway width is between 36 and 39 feet wide with one travel lane and a bicycle lane in each direction. On-street parallel parking is provided on the north side of the street, starting approximately 230 feet east of the intersection of Hampshire Street/17th Street. Between Bryant and Hampshire streets there are 10 vehicle parking spaces on the north side of the street, including one Americans with Disabilities Act (ADA)-accessible space. On this segment of 17th Street, field visits did not result in observation of any hazardous conditions pertaining to vehicle-to-vehicle conflicts.

Mariposa Street is an east-west roadway that runs between Illinois Street to the east and Harrison Street to the west, and is discontinuous for the one-block segment between San Bruno Avenue and Vermont Street to accommodate U.S. 101 as it winds around Potrero Hill (the nearest east-west access across U.S. 101 is at 17th and 16th streets to the north).

Adjacent to the project site the Mariposa Street public roadway width is 36 feet wide with one travel lane in each direction. On-street parallel parking is provided on the north side of the street between the two gated entry and exit points to the bus storage yard (between Bryant and York

[2] As part of the City's WalkFirst project, the San Francisco Planning Department determined the Key Walking Streets network. This map is intended to eventually update the general plan's Transportation Element. Key Walking Streets are characterized by street segments in close proximity to significant pedestrian generators such as schools, parks, tourist activities and shopping districts. The WalkFirst project is a multi-agency effort to improve pedestrian safety and walking conditions, encourage walking as a mode of transportation, and enhance pedestrian connections to key destinations. Information is available at *https://default.sfplanning.org/Citywide/WalkFirst/phase3/WalkFirst_Key_Walking_Streets.pdf.* (Accessed May 5, 2021.)

[3] Vision Zero is a policy that assists in focusing traffic safety investments to reduce severe and fatal injuries to people walking, bicycling, and driving on streets where most severe or fatal injuries are concentrated. The City adopted Vision Zero as a policy in 2014, with the goal of zero traffic deaths for all ways people travel. The bicycle and bus lane improvements on Potrero Avenue is an example of a City project to address safety issues and achieve Vision Zero. A map of the Vision Zero High Injury Network is found at *https://sfgov.maps.arcgis.com/apps/webappviewer/index.html?id=fa37f1274b4446f1bdddd7bdf9e708ff.* (Accessed December 15, 2020.)

streets), and on the south side between Bryant and Hampshire streets. There are six vehicle parking spaces on the north side of the street adjacent to the project site, and eight vehicle parking spaces on the south side of the street between York and Hampshire streets.[4] On this segment of Mariposa Street, field visits did not result in observation of any hazardous conditions pertaining to vehicle-to-vehicle conflicts.

Harrison Street runs east-west between The Embarcadero and 12th Street, and north-south west of 12th Street. Harrison Street is a two-way roadway between The Embarcadero and Third Street, a one-way westbound roadway between Third and 10th streets, and a two-way roadway between 10th and Cesar Chavez streets. North of 13th Street, Harrison Street is an access route to and from westbound I-80. In the vicinity of the project site Harrison Street has one travel lane and a bicycle lane in each direction. The general plan identifies Harrison Street as a Major Arterial in the Congestion Management Plan (CMP) Network, a Metropolitan Transportation System (MTS) Street, a Transit Preferential Street (secondary transit street), and a Neighborhood Commercial Street. Harrison Street is also part of the Vision Zero High Injury Network.

Bryant Street runs east-west between The Embarcadero and 11th Street, and north-south west of 11th Street. Bryant Street is a two-way roadway between Cesar Chavez and 11th streets, a one-way eastbound roadway between 11th and Sterling streets, and a two-way roadway between Sterling Street and The Embarcadero. North of 13th Street, Bryant Street is an access route to and from eastbound I-80 and the Bay Bridge. The general plan identifies Bryant Street as a Major Arterial in the CMP Network, an MTS Street, a Transit Preferential Street (transit important and secondary transit street), and a Neighborhood Commercial Street. Between 17th and 13th streets, there are bicycle lanes on each side of the street.

The Bryant Street roadway width adjacent to the project site is 50 feet with one travel lane in each direction. On the east side of Bryant Street between 17th and Mariposa streets, there is a bus stop at the northbound approach to Mariposa Street and 15 vehicle parking spaces, while on the west side of the street there are two bus stops, six vehicle parking spaces, and two commercial vehicle loading spaces. Field surveys of conditions adjacent to the project site did not identify any hazardous conditions pertaining to vehicle-to-vehicle conflicts.

[4] The KQED headquarter facility renovation project at 2601 Mariposa Street was initiated in September 2019 and is scheduled to be completed within two years (summer 2021). Information is available at *https://www.kqed.org/pressroom/10976/kqed-breaks-ground*. (Accessed May 5, 2021.) The segment of Mariposa Street between Bryant and York streets currently has six vehicle parking spaces and a 44-foot-wide passenger loading (white) zone.

York Street runs north-south between Mariposa Street to the north and Cesar Chavez Street to the south. In the vicinity of the project site, York Street has one travel lane in each direction and terminates at Mariposa Street as a "T" intersection.[5]

Hampshire Street runs north-south between Alameda Street to the north and Cesar Chavez Street to the south. Hampshire Street is partially discontinuous between Alameda and 17th streets, and north of 17th Street it provides driveway access to the San Francisco Recreation and Parks Department's Franklin Square maintenance area and off-street parking facilities for adjacent buildings. Hampshire Street has one travel lane in each direction.

Adjacent to the project site, the Hampshire Street roadway width is 50 feet wide with one travel lane in each direction. Between 17th and Mariposa streets, the west side of Hampshire Street (i.e., adjacent to the project site) has 43 parking spaces (all 90-degree angle spaces); the east side (across the street from the project site) has 26 parking spaces of this type and two commercial loading zones that can accommodate about six vehicles. Hazardous conditions pertaining to vehicle-to-vehicle conflicts were not observed on this segment of Hampshire Street during field visits.

Potrero Avenue runs north-south between Division Street to the north and Cesar Chavez Street to the south. Potrero Avenue connects with the U.S. 101 southbound on-ramp at Cesar Chavez Street, and south of Cesar Chavez Street, it connects with Bayshore Boulevard. Potrero Avenue generally has two travel lanes in each direction with dedicated left-turn pockets at key intersections, and a bicycle lane runs in each direction on Potrero Avenue. Between 18th and 24th streets, there is a southbound bus lane. The general plan identifies Potrero Avenue as a Major Arterial in the CMP Network, an MTS Network street, and a Transit Preferential (secondary transit) street. Potrero Avenue is also designated as a Key Walking Street and part of the Vision Zero High Injury Network.

Vehicular Counts/Traffic Conditions

Intersection turning movement counts were collected at the seven study intersections shown in **Figure 3.C.1** in May 2018 and February 2020 during the a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.) peak periods. **EIR Appendix E-1, Summary of Intersection Turning Movement Volumes**, contains a summary of the vehicular traffic volumes by movement at the study intersections. Adjacent to the project site, the intersection of Bryant Street/17th Street is signalized, the intersections of Bryant Street/Mariposa Street and Hampshire Street/Mariposa Street are all-way STOP-sign controlled, while at the T-intersections of Hampshire Street/17th Street and York Street/Mariposa Street the northbound approach is STOP-sign controlled, and eastbound and westbound traffic does not stop.

[5] A T intersection is an intersection where two roadways meet in a perpendicular manner and one roadway does not continue across the other road, forming a "T" shape.

Table 3.C.1: Existing Weekday A.M. and P.M. Peak Hour Vehicle Counts summarizes the existing a.m. and p.m. peak traffic hour volumes on streets near the project site.[6] As shown in the table, the p.m. peak hour traffic volumes on streets adjacent to and nearby the project site are greater than the a.m. peak hour volumes. The p.m. peak hour volumes are greatest on Potrero Avenue and 16th Street, the primary north-south and east-west arterials in the project vicinity, respectively. Adjacent to the project site, traffic volumes are higher on 17th and Bryant streets than on Hampshire or Mariposa streets.

Table 3.C.1: Existing Weekday A.M. and P.M. Peak Hour Vehicle Counts

Street Segment	A.M. Peak Hour	P.M. Peak Hour
16th Street between Bryant Street and Potrero Avenue	1,222	1,598
17th Street between Bryant and Hampshire streets	634	638
Mariposa Street between Bryant and York streets	198	299
Mariposa Street between York and Hampshire streets	211	278
Bryant Street between 16th and 17th streets	555	721
Bryant Street between 17th and Mariposa streets	561	622
Hampshire Street between 17th and Mariposa streets	89	106
Potrero Avenue between 16th and 17th streets	1,437	1,581

Note: Volumes shown are two-way traffic volumes on identified street segments. Intersection turning movement volumes at the seven study intersections are provided in **EIR Appendix E-1**.

Source: Fehr & Peers/LCW Consulting, 2020. Counts conducted on May 31, 2018, or February 19, 2020.

At the intersection of Potrero Avenue/16th Street, traffic volume counts were conducted for the weekday p.m. peak period on a day without an event at the Chase Center (on 16th Street approximately 1 mile east of Potrero Avenue), February 19, 2020, and on a day with a sold-out basketball game at the Chase Center starting at 7:30 p.m., February 20, 2020. As presented in **Table 3.C.2: Existing Weekday P.M. Peak Hour Vehicle Counts, Intersection of Potrero Avenue/16th Street – Non-Event and Event Day Conditions**, traffic volumes during the p.m. peak hour of the 4 p.m. to 6 p.m. peak period did not vary substantially between the non-event and event days.

Table 3.C.2: Existing Weekday P.M. Peak Hour Vehicle Counts
Intersection of Potrero Avenue /16th Street – Non-Event and Event Day Conditions

Intersection Approach	Non-Event Day	Event Day
Northbound	717	716
Southbound	928	1,089
Eastbound	563	539
Westbound	742	779
Total Vehicles	**2,950**	**3,123**

Note: Counts conducted on February 19, 2020, for a non-event day and on February 20, 2020, for an event day. On February 20, 2020, the Golden State Warriors played the Houston Rockets at the Chase Center. The reported attendance was 18,064, with the game beginning at 7:30 p.m.

Source: Fehr & Peers/LCW Consulting, 2020.

[6] The peak hour traffic volume is the volume of vehicles during the peak 60 minutes of the two-hour a.m. (7 a.m. to 9 a.m.) or p.m. (4 p.m. to 6 p.m.) peak periods during which the highest volumes of vehicles were observed.

Potrero Yard is used for bus overnight storage and maintenance activities. Bus travel to and from the yard is considered non-revenue bus travel time. Non-revenue buses are not in service picking up and dropping off passengers; rather, they are traveling to or from the facility and a terminus point where revenue service begins or ends. Bus, non-revenue vehicle, and staff vehicle access to the yard and maintenance and operations building is from Mariposa Street via the 44-foot-wide gate just west of the entry control booth and the bus entry bays near Hampshire Street and from the second-floor parking deck accessed via a 52-foot-wide curb cut and gated driveway on 17th Street near Hampshire Street.

Six Muni bus routes currently operate out of the Potrero Yard: the 5 Fulton, 5 Fulton Rapid, 6 Haight/Parnassus, 14 Mission, 22 Fillmore, and 30 Stockton routes. In general, the peak period for buses leaving Potrero Yard to access their routes is between 4 a.m. and 7 a.m., with the majority leaving between 5 a.m. and 6 a.m. Buses generally return to the yard in the evening between 7 p.m. and 9 p.m. Thus, the peak transit vehicle travel to and from the yard occurs prior to the a.m. peak hour for adjacent street traffic, which is generally between 8 a.m. and 9 a.m., and after the p.m. peak hour, which is generally between 5 p.m. and 6 p.m.

Field data were collected over a 24-hour period at the existing project site driveways on February 18, 2020. A total of 952 total vehicles entered and exited the four existing driveways for the facility (183 inbound and 187 outbound via 17th Street, and 290 inbound and 292 outbound on Mariposa Street). Of the 952 daily vehicles, 32 percent were buses and 68 percent were autos and trucks.

WALKING CONDITIONS

This subsection describes the absence, discontinuity, or presence of facilities for people walking[7] within the transportation study area. It also identifies any potentially or observed existing hazardous conditions at locations where people walk and describes the number of people walking at adjacent study intersections.

The project site slopes uphill toward the north and east (towards the intersection of Hampshire Street/17th Street) and downhill toward the south and west (towards the intersection of Bryant Street/Mariposa Street). The northeast-to-southwest slope is approximately 4.3 percent. The north-to-south downhill slope is approximately 5.5 percent along Hampshire Street and 3.5 percent along Bryant Street. The east-to-west slope along 17th Street is approximately 3 percent; along Mariposa Street, it is relatively flat or at grade with a slope of 1 percent. The project site is not accessible to the public. SFMTA staff walking to the site access the main facility entrance on Mariposa Street

[7] People walking includes people with disabilities who may or may not require personal assistive mobility devices (e.g., wheelchairs, walkers, crutches, canes).

immediately east of the entry control booth midway between Bryant and Hampshire streets or use a secondary entrance on Hampshire Street just north of Mariposa Street.

Each of the streets adjacent to the project site is identified as a mixed-use street in the Better Streets Plan. Streets with this designation have a minimum sidewalk width (i.e., the width of sidewalk between the curb and property line) of 12 feet and a recommended sidewalk width of 15 feet. The sidewalks adjacent to the project site along 17th, Hampshire, and Bryant streets are each 15 feet wide and meet the Better Streets Plan recommended sidewalk width. The existing Potrero Yard facility encroaches on the Mariposa Street sidewalk right-of-way, and therefore the Mariposa Street sidewalk is only 7 feet wide and does not meet the minimum sidewalk width of 12 feet specified in the Better Streets Plan.

As noted above, the adjacent intersection of Bryant Street/17th Street is newly signalized and has pedestrian countdown signals, but does not include leading pedestrian intervals.[8] The adjacent intersections of Bryant Street/Mariposa Street and Hampshire Street/Mariposa Street are all-way STOP-sign-controlled intersections. At the adjacent T-intersections of Hampshire Street/17th Street and York Street/Mariposa Street, the northbound approach is STOP-sign controlled, while eastbound and westbound traffic does not stop. ADA-compliant curb ramps are provided at all intersections in the transportation study area. Crosswalks in the continental design[9] are provided on all four legs of the signalized intersection of Bryant Street/17th Street and the unsignalized intersection of Bryant Street/Mariposa Street. Adjacent to the project site the curb-to-curb roadway widths are 50 feet for Bryant and Hampshire streets and 36 feet for Mariposa and 17th streets. These roadways widths are common for urban residential streets, encouraging slower travel speeds and allowing for shorter crossing distances at intersections.

Within the transportation study area, Potrero Avenue and 16th, 17th, and Harrison streets have been designated as part of the Vision Zero High-Injury Network. The network identifies street segments in San Francisco that have a high number of fatalities and severe injuries.[10]

In general, the conditions for people walking are satisfactory. During field observations conducted in May 2018 and February and March 2020, crosswalks and sidewalks were generally observed to

[8] A leading pedestrian interval is a signal phase at signalized intersections that typically provides pedestrians a three- to five-second head start when entering an intersection with a corresponding green signal in the same direction of travel. For vehicle drivers, the leading pedestrian intervals make it easier to see people walking in the intersection and reinforce their right-of-way over turning vehicles.

[9] Crosswalks with a continental design have parallel markings that are the most visible to drivers. Use of continental design for crosswalk marking also improves crosswalk detection for people with low vision and cognitive impairments.

[10] San Francisco Department of Public Health-Program on Health, Equity and Sustainability, Vision Zero High Injury Network: 2017 Update – A Methodology for San Francisco, California, available at *https://sfgov.maps.arcgis.com/apps/webappviewer/index.html?id=fa37f1274b4446f1bdddd7bdf9e708ff*, accessed December 15, 2020.

be operating with unconstrained conditions, with normal walking speeds, freedom to bypass other people walking. As noted above, the streets adjacent to the project site have roadway widths that range between 36 and 50 feet, which is typical for urban residential streets. These narrower roadway widths reduce the distance and time for people crossing the roadway, and facilitate pedestrian travel through the study area. At intersections, no conditions that would impede pedestrian travel (e.g., physical barriers or substandard intersection design) were observed. Driveways to the existing transit facility are located on Mariposa and 17th streets, which are relatively flat (i.e., flat or up to 3 percent grade, as described above), and sightlines for people walking on the sidewalk and vehicles exiting the facility are adequate. Sidewalks on Mariposa Street adjacent to the western portion of the project site are narrow; however, due to the low volumes of people walking on Mariposa Street, they do not impede access for people walking on Mariposa Street. Overall, no substantial safety or right-of-way conflicts between people walking and bicyclists, buses or other vehicles were observed on streets adjacent to the project site.

Table 3.C.3: Existing Weekday A.M. and P.M. Peak Hour Counts of People Walking within Crosswalks presents counts of the number of people crossing at the intersections adjacent to the project site. The number of people crossing and walking on streets near the project site is greater during the p.m. peak hour than during the a.m. peak hour. Overall, the volume of people walking in the area is relatively low (about 50 to 100 people per hour during the peak hours). The volume of people walking is highest at the intersections of Bryant Street/17th Street and Bryant Street/Mariposa Street.

BICYCLING CONDITIONS

This subsection describes the absence, discontinuity, or presence of facilities for people bicycling within the transportation study area, and identifies any potentially or observed existing hazardous conditions at locations where people bicycle. In addition, it describes the number of people bicycling in the vicinity of the project site.

The transportation study area contains several existing bicycle facilities. Bicycle facilities are typically classified as class I, class II, class III, or class IV facilities, described as follows.[11]

- Class I: Bike paths with exclusive rights-of-way for use by people bicycling or people walking.
- Class II: Bikeways that are striped within the paved areas of roadways and established for the exclusive use of people bicycling in separated bicycle lanes. The separated bicycle lanes provide a striped, marked, and signed lane that is buffered from vehicular traffic. These facilities, which are located on roadways, reserve 4 to 5 feet of space for bicycle traffic exclusively.

[11] California Streets and Highway Code section 890.4, *https://codes.findlaw.com/ca/streets-and-highways-code/shc-sect-890-4.html*, accessed December 15, 2020.

Table 3.C.3: Existing Weekday A.M. and P.M. Peak Hour Counts of People Walking within Crosswalks

Intersection/Crosswalk Location	A.M. Peak Hour	P.M. Peak Hour
Bryant Street/17th Street		
North (i.e., crossing Bryant Street)	7	52
South	30	36
East (i.e. crossing 17th Street)	45	84
West	40	73
Total all crosswalks	***122***	***245***
Bryant Street/Mariposa Street		
North	23	34
South	88	62
East	44	59
West	57	76
Total all crosswalks	***212***	***231***
Hampshire Street/17th Street		
South	33	47
East	3	4
West	9	18
Total all crosswalks	***45***	***69***
Hampshire Street/Mariposa Street		
North	10	25
South	41	34
East	23	24
West	27	20
Total all crosswalks	***101***	***103***

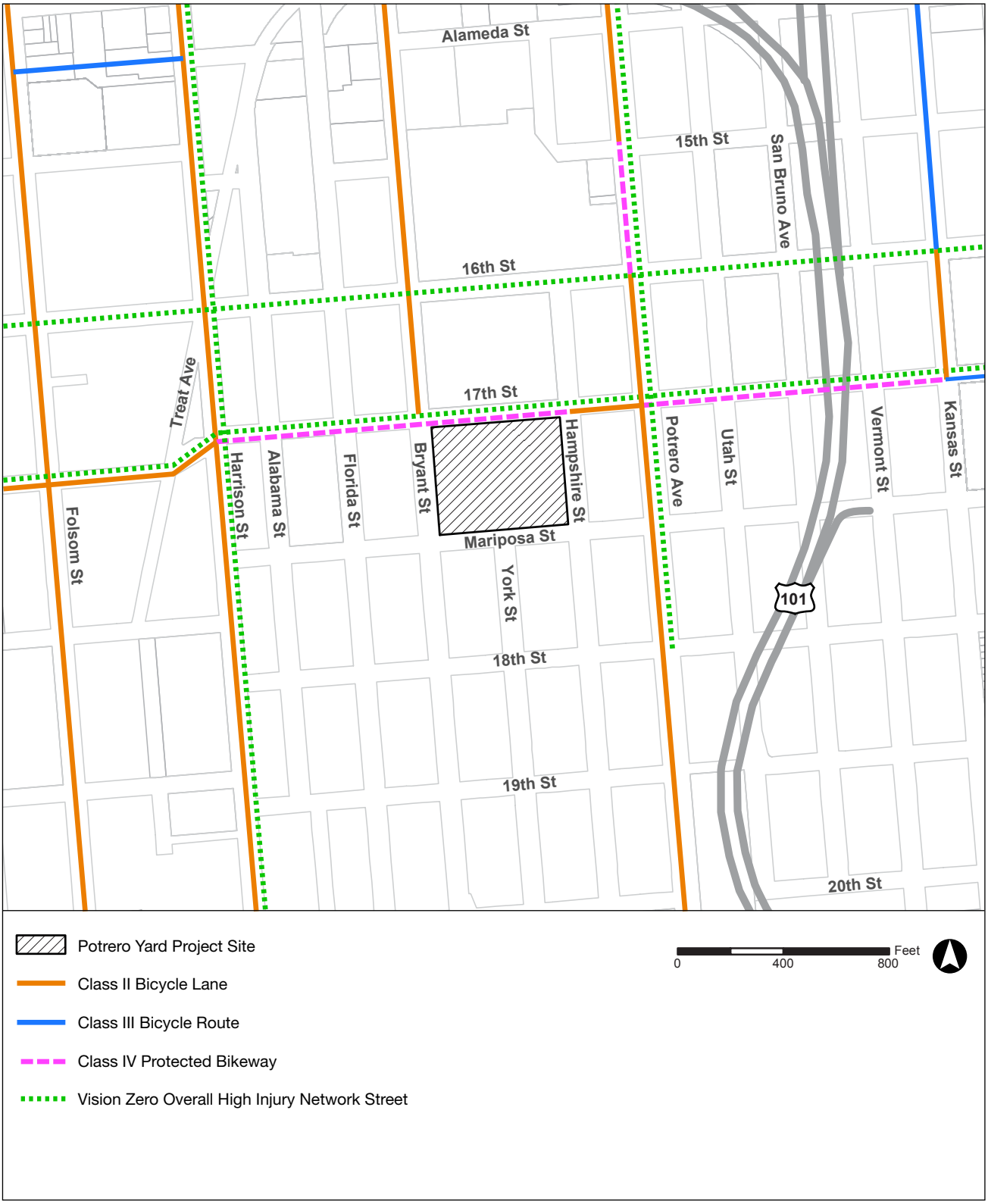
Note: Counts conducted on May 31, 2018, or February 19, 2020. See **EIR Appendix E-2, Vehicle, Bicycle, and Pedestrian Counts**.

Source: Fehr & Peers/LCW Consulting, 2020.

- Class III: Signed bicycle routes that allow people bicycling to share travel lanes with vehicles and may include a shared-lane marking.
- Class IV: An exclusive bicycle facility that is separated from vehicular traffic by a buffer zone (also referred to as a cycle track). The separation from vehicular traffic could be by grade separations, flexible posts, inflexible physical barriers, or on-street vehicular parking.

Figure 3.C.2: Existing Bicycle Route Network in Project Vicinity presents the bicycle network in the transportation study area. As shown on the figure, the streets adjacent to the project area have the following bicycle facilities:

- Seventeenth Street primarily has class II bicycle lanes in both directions of travel between Mississippi Street in Mission Bay and Eureka Street in the Castro; however, portions are class III or class IV facilities. Class II or IV bikeways are provided in each direction between Harrison and Hampshire streets. Adjacent to the project site the bicycle lane is protected (class IV) on the western half of the block between Bryant and Hampshire streets. A class II bicycle lane is provided in both directions of travel for the block between Hampshire Street and Potrero Avenue.



Source: SFMTA San Francisco Bike Map, 2019-https://www.sfmta.com/sites/default/files/pdf_map/2019/06/sfmta-metro-06.12.2019-web.pdf;
SF Planning Department-https://sfplanninggis.org/TIM/

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FIGURE 3.C.2: EXISTING BICYCLE ROUTE NETWORK IN PROJECT VICINITY

- Bryant Street has class II bicycle lanes in both directions of travel between 17th and Division streets (i.e., north of the project site).
- Potrero Avenue between Cesar Chavez and 13th/Division streets has class II bicycle lanes in both directions of travel.
- Harrison Street between 11th and Cesar Chavez streets has class II bicycle lanes in both directions of travel, with the exception of the segment between 23rd and 26th streets, which has class III facilities.
- Folsom Street between 13th and Cesar Chavez streets has class II bicycle lanes in both directions of travel. Between 13th Street and The Embarcadero, Folsom Street has an eastbound class IV separated bikeway or a class II bicycle lane.

There is a Bay Area bicycle-share station on the east side of Bryant Street north of 17th street with 19 bicycle docks. On the streets that border the project site, there are two bicycle racks on the east side of Hampshire Street between 17th and Mariposa streets and three bicycle racks on the south side of Mariposa Street between York and Hampshire streets.

Bicycle volume counts were conducted during the weekday a.m. and p.m. peak periods in May 2018 and February 2020 at the seven study intersections, and counts on selected street segments adjacent to and near the project site are presented in **Table 3.C.4: Existing Weekday A.M. and P.M. Peak Hour Counts of People Bicycling**. As noted in the table, the greatest number of bicyclists was counted on 17th Street and on Potrero Avenue; both streets provide class II bicycle lanes. On 17th Street between Bryant and Hampshire streets, there were generally between 100 and 150 bicyclists per hour, with bicyclists primarily traveling eastbound during the a.m. peak hour and westbound during the p.m. peak hour. There were about 70 bicyclists per hour on Potrero Avenue for both directions of travel, with bicyclists primarily traveling northbound during the a.m. peak hour and southbound during the p.m. peak hour.

Table 3.C.4: Existing Weekday A.M. and P.M. Peak Hour Counts of People Bicycling

Street Segment	A.M. Peak Hour	P.M. Peak Hour
17th Street between Bryant and Hampshire streets	17 wb/101 eb = 118	124 wb/20 eb = 144
Mariposa Street between Bryant and York streets	4 wb/10 eb = 14	4 wb/4 eb = 8
Mariposa Street between York and Hampshire streets	5 wb/14 eb = 19	8 wb/5 eb = 13
Bryant Street between 16th and 17th streets	22 nb/13 sb = 35	19 nb/25 sb = 44
Bryant Street between 17th and Mariposa streets	20 nb/10 sb = 30	9 nb/24 sb = 33
Hampshire Street between 17th and Mariposa streets	54 nb/5 sb = 59	6 nb/34 sb = 40
Potrero Avenue between 16th and 17th streets	65 nb/3 sb = 68	11 nb/59 sb = 70

Note: wb = westbound/eb = eastbound, nb = northbound/sb = southbound.

Source: Fehr & Peers/LCW Consulting, 2020. Counts conducted on May 31, 2018, or February 19, 2020. See **EIR Appendix E-2**.

On streets without bicycle lanes, the number of bicyclists traveling during the peak hours was generally fewer than 30 bicyclists per hour. The exception was on Hampshire Street, which had between 40 and 60 bicyclists per hour. Hampshire Street is used by bicyclists to travel north to eastbound 17th Street during the a.m. peak hour, and from westbound 17th Street to southbound Hampshire Street during the p.m. peak hour. Hampshire Street has 90-degree angle parking and a

north-to-south downhill slope of approximately 5.5 percent between 17th and Mariposa streets. The 90-degree angle parking increases the potential for conflicts between drivers exiting the parking space and bicyclists on the roadway than parallel parking.

As noted above, there are bicycle lanes in both directions of travel on 17th Street between Mission Bay and Castro neighborhoods. The bicycle corridor connects with north-south routes, including at Folsom Street, Harrison Street, Bryant Street (to the north of 17th Street), and Potrero Avenue within the transportation study area. The SFMTA's Bicycle Network Comfort index[12] (i.e., level of traffic stress) is LTS 1, which represents the highest level of ridership comfort. During field surveys conducted in May 2018 and February and March 2020 bicyclists were observed traveling within the bicycle lane unconstrained, with no conflicts at intersections. However, during off-peak periods some bicyclists on 17th Street were observed not stopping at the all-way stop-control intersections of Florida Street/17th Street and Alabama Street/17th Street primarily in the eastbound (uphill) direction. However, because of the generally lower traffic volumes on these streets compared to nearby arterial streets and narrow roadway widths, no conflicts or hazardous conditions were observed. On 17th Street adjacent to the project site there is one driveway west of Hampshire Street that provides inbound and outbound access to the transit facility for buses and maintenance vehicles. On a daily basis there are about 183 inbound and 187 outbound vehicles at this driveway, with a substantial number occurring during the early morning facility peak period of 4 a.m. to 7 a.m.

No physical impediments to bicycling on area roadways were observed. Overall, no substantial safety or right-of-way conflicts between bicyclists, people walking, buses or other vehicles were observed on streets adjacent to the project site.

PUBLIC TRANSIT CONDITIONS

This subsection describes the local and regional public transit service in the transportation study area, including geographic extent, scheduled frequency, and transit stop proximity to the project site. In addition, it describes observed conditions that delay public transit. This section does not discuss non-revenue transit vehicles that access the project site (a discussion of transit facility operations is presented under "Vehicular Counts/Traffic Conditions," above).

Local service in San Francisco is provided by the San Francisco Municipal Railway (Muni), the transit division of the SFMTA. Muni bus routes, cable car lines, and light rail lines can be used to access regional transit. **Figure 3.C.3: Existing Transit Network in Project Vicinity** presents the

[12] SFMTA Map of San Francisco Bike Network Comfort Index, *https://www.sfmta.com/sites/default/files/projects/2017/ComfortIndexCIP_011317_0.pdf*, accessed May 11, 2021. Traffic stress is defined as how comfortable a roadway feels for a person biking, based on interaction with other ways of travel (e.g., people walking or driving), traffic controls (e.g., stop signs, signals), and the geographic features of the area (slope of the street, quality of the pavement).

existing transit network serving the transportation study area and identifies the location of the bus stops for these routes.

As shown in **Figure 3.C.3**, numerous Muni bus routes serve the project site. Muni operates six bus routes within one block of the project site along Bryant Street (27 Bryant), 16th Street (22 Fillmore, 33 Ashbury/18th Street, 55 16th Street), and Potrero Avenue (9 San Bruno, 9R San Bruno Rapid, 33 Ashbury/18th). The 27 Bryant route runs north-south adjacent to the project site on Bryant Street, and there is a bus stop with a transit shelter at the northbound approach to 17th Street (i.e., a near-side stop[13]).

Table 3.C.5: Existing Muni Routes in Project Vicinity presents information for each Muni route that operates within the transportation study area, including service frequencies[14] for the a.m. and p.m. peak periods, general hours of operation, nearest stop location, and neighborhoods served. In addition to these routes, four Muni routes (8 San Bruno, 8AX San Bruno Express, 8BX San Bruno Express, and 14X Mission Express) travel on U.S. 101 but do not stop.

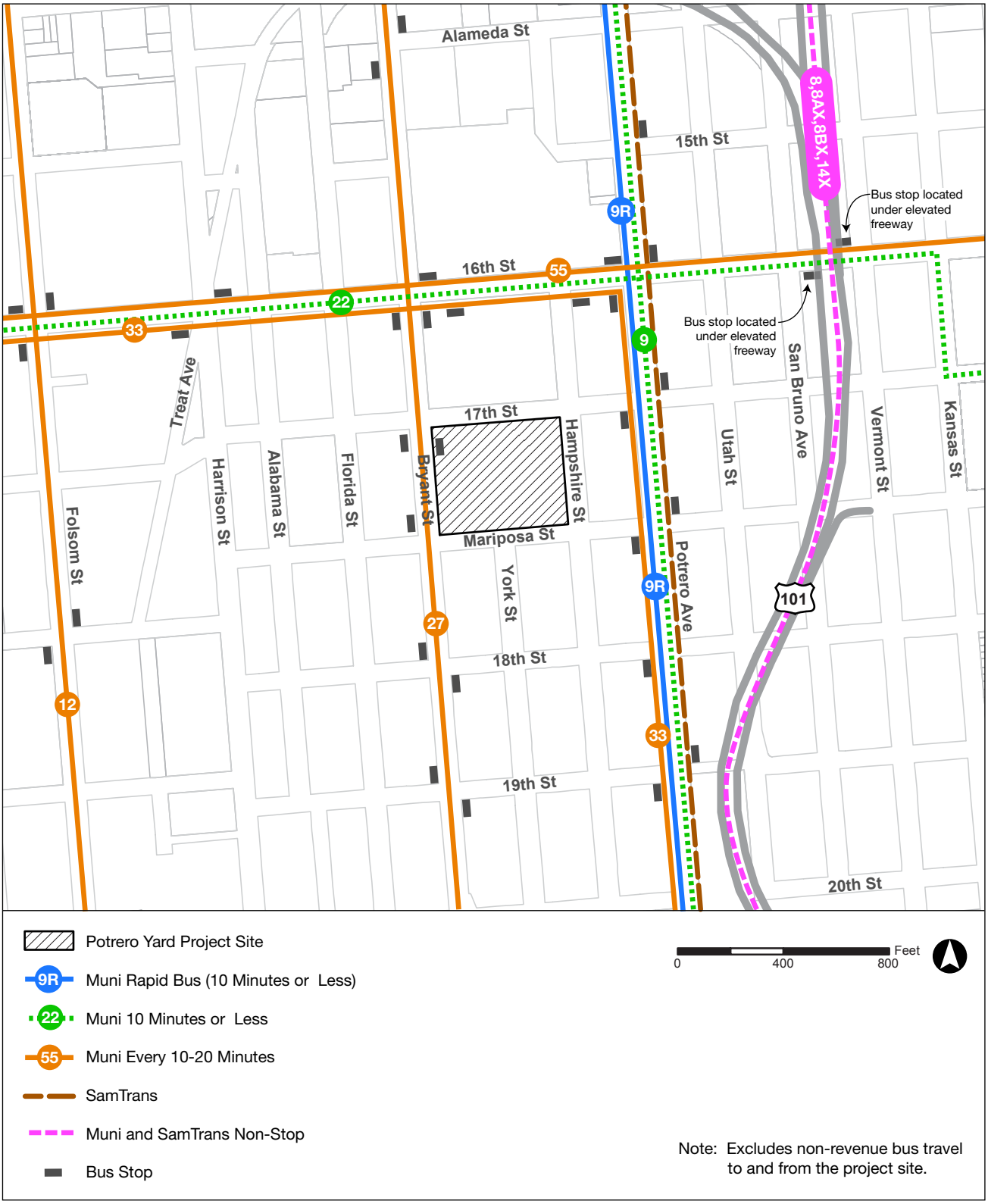
Regional transit providers include Bay Area Rapid Transit (BART), Golden Gate Transit, and San Mateo County Transit District (SamTrans). BART operates heavy rail regional trains and the closest station is located approximately 0.5 mile west of the site (16th and Mission BART station). Golden Gate Transit operates surface buses within 0.8 mile of the project site, along Folsom and Eighth streets.[15] SamTrans operates four surface bus lines in San Francisco, including a commuter express line, along Mission, Ninth, and 10th streets and along Potrero Avenue. The closest stop for SamTrans (for Route 292) is located on Potrero Avenue at 24th Street.

During field surveys conducted in May 2018 and February and March 2020, no conditions that would delay transit were observed. Adjacent to the project site, intersections have been upgraded to accommodate bus travel to and from the existing transit facility entrances and exits on Mariposa and 17th streets (e.g., the bus yard accessed from Mariposa Street and the second-floor maintenance shops accessed from 17th Street) via Bryant Street and to reduce conflicts between transit vehicles and people walking and bicycling. These improvements include a new signal at the intersection of Bryant Street/17th Street, red curbs on Mariposa Street, white diagonal crosshatch markings on Mariposa and Bryant streets, and continental crosswalks at Bryant Street/17th Street and Bryant Street/Mariposa Street.

[13] Near-side stops are stops located at the first or nearest side of the intersection before a transit vehicle passes through the intersection. Far-side transit stops are stops located at the second or farthest side of the intersection after a transit vehicle passes through the intersection.

[14] The service headway is the number of minutes between buses or trains on a particular bus route or light rail line.

[15] Golden Gate Transit, San Francisco System Map, *https://www.goldengate.org/assets/1/31/map-san-francisco.pdf?4763*, accessed August 19, 2020.



Source: MUNI System Map, 2019-http://sfmta.com/sites/default/files/pdf_map/2019/06/sfmta-metro-06.12.2019-web.pdf

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FIGURE 3.C.3: EXISTING TRANSIT NETWORK IN PROJECT VICINITY

Table 3.C.5: Existing Muni Routes in Project Vicinity

Bus Route	Frequencies [NOTE A] (in minutes)		General Hours of Weekday Operation (first and last trips)	Nearest Stop to Project Site	Neighborhoods Served
	Neighborhoods Served	P.M. Peak Period [NOTE B]			
9 San Bruno	12	12	5:30 a.m. – 12:10 a.m.	Potrero Avenue and 17th Street	Bayview, Bernal Heights, Chinatown, Crocker Amazon, Downtown/Civic Center, Excelsior, Financial District, Mission, Potrero Hill, South of Market, Visitacion Valley, Western Addition
9R San Bruno Rapid	9	9	6:20 a.m. – 7 p.m.	Potrero Avenue and 16th Street	Bayview, Bernal Heights, Chinatown, Downtown/Civic Center, Excelsior, Financial District, Mission, Potrero Hill, South of Market, Visitacion Valley, Western Addition
22 Fillmore	8	8	24 hours	16th Street and Bryant Street	Castro/Upper Market, Marina, Mission, Pacific Heights, Potrero Hill, South of Market, Western Addition
27 Bryant	15	15	5:45 a.m. – 12:40 a.m.	Bryant Street and 17th Street	Bernal Heights, Downtown/Civic Center, Financial District, Mission, Nob Hill, Noe Valley, Potrero Hill, Russian Hill, South of Market, Western Addition
33 Ashbury/18th	15	5	6 a.m. – 12:30 a.m.	16th Street and Bryant Street	Bayview, Bernal Heights, Castro/Upper Market, Golden Gate Park, Inner Richmond, Inner Sunset, Mission, Noe Valley, Potrero Hill, Presidio, Presidio Heights, South of Market, Twin Peaks, Haight Ashbury
55 16th Street	15	15	6 a.m. – 12 a.m.	16th Street and Bryant Street	Mission, Potrero Hill, South of Market

Notes:
[A] Frequencies represent wait times between transit vehicles.
[B] The a.m. peak period for Muni service is between 7 a.m. and 10 a.m., and the p.m. peak period is between 3 p.m. and 7 p.m.

Source: SFMTA, *https://www.sfmta.com/getting-around/muni/routes-stops*, Fehr & Peers/LCW Consulting, 2020.

EMERGENCY ACCESS CONDITIONS

This subsection describes the closest emergency access facilities to the project site and identifies any observed delays to emergency access providers adjacent to the construction work sites.

The nearest fire stations to the project site are Station 29 at 299 Vermont Street between 15th and 16th streets (about 0.3 mile northeast of the project site) and Station 7 at 2300 Folsom Street at 19th Street (about 0.4 mile southwest of the project site). The nearest police station is the Mission District police station located at 630 Valencia Street at 17th Street.

During field surveys of the project site and vicinity conducted in February and March 2020, delays to emergency service providers were not observed.

VEHICLE MILES TRAVELED

Vehicle miles traveled per person (or per capita) (VMT) is a measurement of the amount and distance that a resident, employee, or visitor drives, accounting for the number of passengers within a vehicle. In general, higher VMT areas are associated with more air pollution, including greenhouse gas emissions, and energy usage than lower VMT areas. Many interdependent factors affect the amount and distance a person might drive. In particular, the built environment affects how many places a person can access within a given distance, time, and cost, using different ways of travel (e.g., private vehicle, public transit, bicycling, walking, etc.). Typically, low-density development located at great distances from other land uses and in areas with few options for ways of travel provides less access than a location with high density, a mix of land uses, and numerous ways of travel. Therefore, low-density development typically generates more VMT compared to a similarly sized development located in urban areas.

Given these travel behavior factors, on average, persons living or working in San Francisco result in lower amounts of VMT per person than persons living or working elsewhere in the nine-county San Francisco Bay Area region. In addition, on average, persons living or working in some areas of San Francisco result in lower amounts of VMT per person than persons living or working elsewhere in San Francisco. The City displays different amounts of VMT per capita geographically through transportation analysis zones (TAZs).[16]

The San Francisco County Transportation Authority (transportation authority) uses the San Francisco chained activity modeling process to estimate VMT by private automobiles and taxis for different transportation analysis zones. The transportation authority calibrates travel behavior in

[16] Planners use these zones as part of transportation planning models for transportation analyses and other planning purposes. The zones vary in size from single city blocks in the downtown core, multiple blocks in outer neighborhoods, to even larger zones in historically industrial areas such as the Hunters Point Shipyard area.

the model based on observed behavior from the California Household Travel Survey [2010-2012], census data regarding automobile ownership rates and county-to-county worker flows, and observed vehicle counts and transit boardings. The model uses a synthetic population, which is a set of individual actors that represents the Bay Area's actual population, who make simulated travel decisions for a complete day.

The model estimates daily VMT for residential, office, and retail land use types. For residential and office uses, the transportation authority uses tour-based analysis. A tour-based analysis examines the entire chain of trips over the course of a day, not just trips to and from a site. For retail uses, the transportation authority uses trip-based analysis. A trip-based analysis counts VMT from individual trips to and from a site (as opposed to the entire chain of trips). A trip-based approach, as opposed to a tour-based approach, is necessary for retail sites because a tour is likely to consist of trips stopping in multiple locations, and the summarizing of tour VMT to each location would over-estimate VMT.[17,18,19]

Table 3.C.6: Existing VMT Per Capita presents existing average daily VMT per capita for residents, employees, and visitors in the nine-county San Francisco Bay Area and TAZ 538 in which the project site is located. As shown in **Table 3.C.6**, in TAZ 538 people drive substantially less than in the region as a whole, as demonstrated by the fact that the current average daily VMT per capita figures for the various trip types are substantially lower than the regional Bay Area averages for the nine-county San Francisco Bay Area.

Table 3.C.6: Existing VMT per Capita

Trip Type (Land Use)	Bay Area Regional Average	TAZ 538 [NOTE A]
Households (residential)	17.2	5.3
Employment (office)	19.1	9.6
Visitors (retail)	14.9	9.8

Note:
[A] Average daily VMT per capita for TAZ 538, in which the proposed project is located. TAZ 538 is bounded by 17th Street to the north, Hampshire Street to the east, 19th Street to the south, and Harrison Street to the west.

Source: San Francisco Planning Department, Transportation Information Map, *http://www.sftransportationmap.org*.

[17] To state another way: a tour-based assessment of VMT at a retail site would consider the VMT for all trips in the tour, for any tour with a stop at the retail site. If a single tour stops at two retail locations, for example, a coffee shop on the way to work and a restaurant on the way back home, then both retail locations would be allotted the total tour VMT. A trip-based approach allows us to apportion all retail-related VMT to retail sites without double-counting.

[18] Retail travel is not explicitly captured in San Francisco chained activity modeling process; rather, there is a generic "Other" purpose which includes retail shopping, medical appointments, visiting friends or family, and all other non-work, non-school tours. The retail efficiency metric captures all of the "Other" purpose travel generated by Bay Area households. The denominator of employment (including retail; cultural, institutional, and educational; and medical employment; school enrollment, and number of households) represents the size, or attraction, of the zone for this type of "Other" purpose travel.

[19] San Francisco Planning Department, Executive Summary: Resolution Modifying Transportation Impact Analysis, Appendix F, Attachment A, March 3, 2016.

LOADING CONDITIONS

This subsection describes the absence, discontinuity, or presence of features related to commercial and passenger loading activities in the transportation study area. The description includes the location of commercial and passenger on-street loading spaces, hour restrictions, and usage. In addition, it identifies any potentially or observed hazardous conditions or delays to public transit due to loading activities.

Freight Loading

Freight loading activities associated with the existing Potrero Yard maintenance and operations activities are conducted within the project site.

On-street commercial loading spaces (yellow zones or metered spaces) are reserved for use by freight vehicles with San Francisco commercial permit stickers or similar commercial trucks. There are no on-street commercial loading spaces directly adjacent to the project site. The nearest commercial loading spaces include two spaces (a 47-foot-wide zone) located on the west side of Bryant Street between 17th and Mariposa streets, and six spaces within two commercial loading zones on the east side of Hampshire Street between 17th and Mariposa streets (a 38-foot-wide zone and a 20-foot-wide zone, with 90-degree angle loading spaces).[20] All three zones are across the street from the project site, and loading activities are subject to 30-minute loading, Monday through Friday, between 7 a.m. and 6 p.m. After 6 p.m., the commercial loading spaces become available for general vehicular parking. During midday period field surveys in March 2020, three of the eight commercial loading spaces were occupied (see **EIR Appendix E-3, Loading and Parking Data**). No conflicts between commercial and freight loading activities and people walking, bicycling, or driving, or transit operations were observed.

Passenger Loading

Passenger loading/unloading zones (i.e., white zones) provide a place to load and unload passengers for adjacent businesses and residences. These zones are intended for safe and efficient passenger drop-off and pickup and require permit renewal biennially. Passenger loading/unloading zones are reserved for five-minute passenger or material loading and unloading activities, and vehicles must be attended. Parking for more than 10 minutes is prohibited within these designated zones. Passenger loading and unloading is also permitted in commercial loading spaces as long as it is active loading/unloading and does not exceed three minutes.

There are no passenger loading/unloading zones adjacent to the project site. The nearest passenger loading/unloading zone is located on the south side of Mariposa Street between Bryant and

[20] The commercial loading space supply within the commercial zones on Hampshire Street was estimated using an average of 10 feet per space.

Hampshire streets (about 44 feet in length, accommodating two vehicles at one time),[21] and the passenger loading regulation is in effect at all times. However, this zone served the KQED headquarters building, which is currently being renovated, and the sidewalk is blocked off for construction staging for the renovation project. A temporary protected pedestrian walkway is provided within the curbside parking lane, and therefore this passenger loading/unloading zone is temporarily suspended.

During field surveys of the project site and vicinity conducted in February and March 2020, no passenger loading/unloading activities were observed.

PARKING CONDITIONS

California Senate Bill (SB) 743 amended the California Environmental Quality Act (CEQA) by adding California Public Resources Code (PRC) section 21099 regarding the analysis of parking impacts for certain urban infill projects in transit priority areas.[22] PRC section 21099(d), effective January 1, 2014, provides that "…parking impacts of a residential, mixed-use residential, or employment center project on an infill site located within a transit priority area shall not be considered significant impacts on the environment."[23] Accordingly, parking is no longer to be considered in determining if a project has the potential to result in significant environmental effects for projects that meet all three criteria established in the statute.

The proposed project meets all of the criteria, and thus the transportation impact analysis does not consider the adequacy of parking in determining the significance of project impacts under CEQA. Parking is not discussed further in this EIR.

REGULATORY FRAMEWORK

This section summarizes the relevant transportation plans and policies of the City, regional, and state agencies that have policy and regulatory control within the proposed project area. There are no relevant federal regulations that pertain to transportation impacts associated with the proposed project.

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[21] The passenger loading/unloading space supply within the passenger loading/unloading zone on the south side of Mariposa Street was estimated using an average of 20 feet per space.

[22] A "transit priority area" is defined as an area within 0.5 mile of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resource Code section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service intervals of 15 minutes or less during the morning and afternoon peak commute periods. A map of San Francisco's Transit Priority Areas is available online at: *https://sfmea.sfplanning.org/Map%20of%20San%20Francisco%20Transit%20Priority%20Areas.pdf.* (Accessed May 5, 2021.)

[23] California Office of Planning and Research, *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing State Senate Bill 742 (Steinberg, 2013)*, January 20, 2016.

STATE

CEQA Section 21099(b)(1) (Senate Bill 743)

CEQA section 21099(b)(1) requires the Office of Planning and Research to develop revisions to the CEQA Guidelines, thereby establishing criteria for determining the significance of transportation impacts from projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that, upon certification of the revised guidelines for determining transportation impacts, pursuant to section 21099(b)(1), automobile delay, as described solely by level of service (LOS) or similar measures of vehicular capacity, or vehicular traffic congestion shall not be considered a significant impact on the environment under CEQA.

In January 2016, the Office of Planning and Research published for public review and comment its *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*, *Implementing Senate Bill 743* (proposed transportation impact guidelines), recommending that project transportation impacts be measured using a VMT metric.[24] In January 2019, changes to the CEQA statutes and guidelines went into effect, including a new section 15064.3 that states that VMT is the most appropriate measure of transportation impacts, and includes updated criteria for analyzing transportation impacts.

REGIONAL

Plan Bay Area

Plan Bay Area 2040 is a state-mandated, integrated long-range transportation and land use plan. As required by SB 375, all metropolitan regions in California must complete a Sustainable Communities Strategy as part of a Regional Transportation Plan. This strategy integrates transportation, land use, and housing to meet greenhouse gas reduction targets set by the California Air Resources Board. The plan meets those requirements. In addition, the plan sets a road map for future transportation investments and identifies what it would take to accommodate expected growth. The plan neither funds specific transportation projects nor changes local land use policies.

In the Bay Area, the Metropolitan Transportation Commission and the Association of Bay Area Governments adopted the latest plan in 2017. To meet the greenhouse gas reduction targets, the Plan Bay Area identifies priority development areas. The agencies estimate approximately 77 percent of the Bay Area housing and 55 percent of Bay Area job growth will occur within priority development areas between 2010 and 2040.

[24] Office of Planning and Research, Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing Senate Bill 743 (Steinberg, 2013), January 20, 2016.

LOCAL

Transit First Policy

In 1999, San Francisco voters amended the City Charter (article 8A, section 8A.115) to include the Transit First Policy, which was first articulated as a City priority policy by the San Francisco Board of Supervisors (board of supervisors) in 1973. The Transit First Policy is a set of principles that underscore the City's commitment to have travel by transit, bicycle, and foot be given priority over use of the private automobile. These principles are embodied in the policies and objectives of the transportation element of the San Francisco General Plan. All City boards, commissions, and departments are required, by law, to implement the Transit First Policy's principles in conducting City affairs.

Vision Zero

In 2014, the board of supervisors adopted a resolution to implement an action plan to reduce traffic facilities to zero by 2024 through engineering, education, and enforcement (resolution 91-14). Numerous San Francisco agencies responsible for the aforementioned aspects of the action plans adopted similar resolutions. In 2017, the board of supervisors amended the Transportation and Urban Design elements of the General Plan to implement Vision Zero (ordinance 175-17). In 2019, the SFMTA and the Department of Public Health published the third version of the Vision Zero San Francisco Action Strategy that lays out the strategic actions for City departments and agencies to reach the City's Vision Zero goal.

San Francisco General Plan

The Transportation Element of the San Francisco General Plan is composed of objectives and policies that relate to eight aspects of the citywide transportation system: general regional transportation, congestion management, vehicle circulation, transit, people walking, bicycles, citywide vehicular parking, and goods management. The Transportation Element, which references San Francisco's Transit First Policy in its introduction, contains objectives and policies that are directly pertinent to consideration of the proposed project, including objectives related to prioritizing sustainable modes of travel, integrating and connecting land use development and transportation investments, and designing streets for walking, bicycling, and public transit.

The San Francisco General Plan also includes the Mission Area Plan, which provides objectives and policies to guide land use development, to enhance urban space and urban form, and to improve the transportation network for all ways of travel.

Better Streets Plan, Policy, and Requirements

In 2006, the San Francisco Board of Supervisors adopted the Better Streets Policy. Since then, the board has amended the policy several times, including in 2010 to reference the Better Streets Plan. The Better Streets Plan creates a unified set of standards, guidelines, and implementation strategies to govern how San Francisco designs, builds, and maintains its pedestrian environment. The San Francisco Planning Code (planning code) requires certain new development projects to make changes to the public right-of-way, such that it is consistent with the Better Streets Plan (section 138.1). The planning code requires most projects to plant street trees and some larger projects to submit a streetscape plan that may require elements such as sidewalk widening, transit boarding islands, and medians.

San Francisco Regulations for Working in San Francisco Streets

The San Francisco Regulations for Working in San Francisco Streets (SFMTA Blue Book), prepared and regularly updated by SFMTA under authority derived from the San Francisco Transportation Code, serves as a guide for contractors working in San Francisco streets. The manual establishes rules and guidance so that work can be done safely and with the least possible interference with people walking and bicycling, transit, and vehicular traffic. The manual also contains relevant general information, contact information, and procedures related to working in the public right-of-way when under the jurisdiction of agencies other than SFMTA. The manual identifies permits that may be required by San Francisco Public Works (public works) during construction, such as excavation permits, temporary occupancy permits, street space permit, additional street space permits, and night noise permits. The contractor would also need to comply with all applicable public works orders such as public works' order 167,840 which provides guidelines for the placement of barricades at construction sites so that a safe and accessible path of travel is provided for people walking around and/or through construction sites.

In addition to the regulations presented in the manual, all construction-related traffic control, warning, and guidance devices must conform to the California Manual on Uniform Traffic Control Devices. Furthermore, contractors are responsible for complying with all applicable City, state, and federal codes, rules, and regulations. The party responsible for setting up traffic controls during construction shall be held accountable and responsible if such controls do not meet the guidance and requirements established by the manual and any applicable City and state requirements.

San Francisco Public Works Standard Construction Measures

As discussed in **EIR Chapter 2, Project Description**, public works' Standard Construction Measures (SCMs) would apply to the proposed project or project variants (see **Table 2.3**, pp. 2.50-2.53). The SFMTA and private project co-sponsor (together referred to as the project sponsor team) will implement public works' SCMs as part of the proposed project or project variants, including

SCM #4, Traffic. **SCM #4** establishes procedures related to construction of certain City projects that have the potential to affect traffic. It requires all projects to implement traffic control measures to maintain traffic and pedestrian circulation on streets affected by project construction. In addition, the traffic control measures need to be consistent with the requirements of the SFMTA Blue Book. Any temporary rerouting of transit vehicles or relocation of transit facilities would need to be coordinated with SFMTA Muni Operations. Refer to **EIR Appendix C** for additional information on public works' SCMs.

Transportation Sustainability Fee

The planning code requires certain new development projects to pay an updated transportation sustainability fee, based on the size of the development, to the City (section 411A). The fee offsets a portion of the development project's impacts on the transportation system. The City may use the fee only toward specific programs consisting of transit capital maintenance, local and regional transit service expansion and reliability, complete streets, and program administration.

Transportation Demand Management Program

The planning code requires certain new development projects to incorporate "design features, incentives, and tools" to reduce VMT (section 169). Development projects must choose measures from a menu of options to develop an overall transportation demand management (TDM) plan. Some options overlap with requirements elsewhere in the planning code (e.g., bicycle parking, car-share parking). Each development project's TDM plan requires routine monitoring and reporting to the planning department to demonstrate compliance.

Off-street Loading

The planning code requires certain new development projects to include off-street freight loading spaces (section 152.1). The planning code requirements for loading spaces depends on the size of the development projects, and specifies dimensions of the spaces and allows for substituted service vehicle spaces (section 154(b)).[25]

[25] Per San Francisco Planning Code section 154(b), in the C-3 and the South of Market districts, substitution of two service vehicle spaces for each required off-street freight loading space may be made, provided that a minimum of 50 percent of the required number of spaces are provided for freight loading.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

San Francisco Administrative Code Chapter 31 directs the planning department to identify environmental effects of a project using as its base the environmental checklist form set forth in Appendix G of the CEQA Guidelines. As it relates to transportation and circulation, Appendix G asks if the project would:

- Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b), which pertains to VMT;
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses; or
- Result in inadequate emergency access.

The planning department uses significance criteria to facilitate the transportation analysis and address the Appendix G checklist. The department separates the significance criteria into construction and operation.

Construction

Construction of the project would have a significant effect on the environment if it would require a substantially extended duration or intense activity; and the effects would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations; or interfere with accessibility for people walking or bicycling; or substantially delay public transit.

Operation

The operational impact analysis addresses the following five significance criteria. A project would have a significant effect if it would:

- Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations;
- Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access;
- Substantially delay public transit;
- Cause substantial additional VMT or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network; or
- Result in a loading deficit and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving or substantially delay public transit.

APPROACH TO ANALYSIS

Project Features

The project includes the following onsite transportation features and proposes the following changes to the street network outside of the project site:

Roadway Network Features

The proposed project would include multiple curb cuts/driveways for the transit facility on Mariposa Street (a 63-foot-wide curb cut, a 47-foot-wide curb cut, and a 97-foot-wide curb cut for three bus bays), a driveway to the basement-level loading facilities for the transit facility and joint development on Mariposa Street (20-foot-wide curb cut), and an emergency bus exit onto 17th Street (42-foot-wide curb cut).

See **Figure 2.3: Proposed Site Plan** in **EIR Chapter 2, Project Description**, p. 2.20, for an illustration of the proposed changes.

Walking Network Features

The proposed project would include the following changes to the walking network adjacent to the project site:

- Adjacent to the project site, reconstruction of the sidewalks on 17th, Bryant, and Hampshire streets. The sidewalks would remain at least 15 feet wide, which would meet the Better Streets Plan recommended width. The Mariposa Street sidewalk would be widened from 7 to 15 feet, which would meet the recommended width under the Better Streets Plan.
- Sidewalk bulbouts onto Bryant and Mariposa streets adjacent to the project site at the intersection of Bryant Street/Mariposa Street.
- New continental crosswalks at Hampshire Street/17th Street, Hampshire Street/Mariposa Street, and Mariposa Street/York Street and associated curb ramps, if missing.
- Raised crosswalk across 17th Street at Hampshire Street with a rectangular rapid flashing beacon.

Bicycle Network Features

The proposed project would upgrade the existing bicycle lanes on 17th Street between Bryant and Hampshire streets by converting the existing striped and partially protected bicycle lanes into wider green protected bikeways in both directions.

Transit Network Features

The proposed project does not include any transit network features, such as modifications to transit service, operations, or amenities.

Loading Features

The proposed project would include two onsite commercial loading spaces within the below-grade garage to service the transit facility (one loading space) and the joint development land uses (one loading space). These onsite loading spaces would be accessible from Mariposa Street.

In addition, the proposed project would include the following on-street commercial and passenger loading zones adjacent to the project site:

- On-street passenger (60-foot) and commercial loading (40-foot) zones on Bryant Street
- A 60-foot parallel passenger loading bulbout on the west side of Hampshire Street adjacent to the project site, north of the intersection of Hampshire Street/Mariposa Street

Vehicle Parking Features

The proposed project would remove or reconfigure on-street parking on streets adjacent to the project site. Overall, the proposed project would result in a reduction of about 48 general vehicle parking spaces, including the following:

- On 17th Street, the project would prohibit on-street parking on the north side between Bryant and Hampshire streets (a reduction of 10 vehicle parking spaces on 17th Street). The existing accessible parking space on this segment would be relocated to another location, likely to Bryant Street between Mariposa and 16th streets; however, the exact location would be determined following an assessment by the SFMTA of feasible locations.
- On Mariposa Street, the project would prohibit on-street parking on the north side between Bryant and Hampshire streets (a reduction of six vehicle parking spaces on Mariposa Street).
- On the west side of Hampshire Street, the project would install a 60-foot parallel passenger loading bulbout north of Mariposa Street and a 10-foot red daylighting[26] zone south of 17th Street. This would reduce the number of 90-degree angle parking spaces on the west side of Hampshire Street from 43 to 34 (a reduction of nine vehicle parking spaces).
- On the east side of Hampshire Street, the project would convert the 90-degree angle general parking (26 spaces) and commercial loading (six spaces) spaces to parallel parking spaces. In addition, the project would install a 10-foot daylighting zone south of 17th Street. There are multiple driveways on the east side of Hampshire Street, and the conversion of the spaces from 90-degree to parallel would reduce the total number of spaces from 31 to 14 (a reduction of 17 spaces).

[26] Daylighting is the removal of vehicular parking near intersections and crosswalks to improve the sightline distance and visibility for people.

- On Bryant Street, the project would install a 40-foot commercial loading zone and a 60-foot passenger loading zone, and a bulbout into Bryant and Mariposa streets at the intersection of Bryant Street/Mariposa Street. The 15 existing parallel parking spaces would be reduced to nine spaces (a reduction of six vehicle parking spaces).

Transportation Demand Management Plan

Planning code section 169 identifies the applicability of the TDM program and establishes the TDM Program Standards for new development. Both the transit facility and joint development components of the proposed project would be subject to the City's TDM program requirements and would include preparation and implementation of a TDM plan.

Project Variants

The proposed project includes the following four variants, each with a minor change to an element of the project:

- **Emergency Exit Relocation Variant:** Relocation of the proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street.
- **Joint Development Lobby Relocation Variant:** Relocation of joint development lobby off Mariposa Street to Hampshire Street.
- **Active 17th Street Variant:** Site program revision to include active uses along 17th Street frontage, including internal relocation of ramps from the north portion of the site to a more southerly location.
- **Employee and Family Support Variant:** Site program revision to include childcare, or related use, in a portion of the space identified in the proposed project for ground-floor commercial use.

The transportation methodologies and analyses of the proposed project also apply to the project variants except where the methodological or analytical approach to the minor relocations and the site programming changes are explicitly called out, e.g., for the site programming changes of the Employee and Family Support Variant. The project variants would not affect the demolition or construction program. **EIR Chapter 2, Project Description**, pp. 2.56-2.58, presents a detailed description of each variant.

Methodology and Thresholds of Significance

This section summarizes the methodology for analyzing transportation impacts and information considered in developing travel demand estimates for the proposed project. In addition, this section summarizes the methodology for analyzing any quantitative thresholds of significance for determining transportation impacts under existing plus project conditions. The travel demand and impact analysis methodology use the data and guidance within the department's Transportation Impact Analysis Guidelines (2019 SF Guidelines). If the methodology differs from that in the guidelines, such differences are summarized in the following discussion.

Analysis Periods and Geographic Scope

The geographic scope of potential transportation impacts encompasses the transportation study area and study intersections. The transportation study area includes aspects of the transportation network within generally 0.25 mile of the center of the project site, bounded by Potrero Avenue to the east, Harrison Street to the west, 16th Street to the north, and 18th Street to the south. The transportation study area and study intersections are shown in **Figure 3.C.1**, p. 3.C.2.

The analysis of the proposed project was conducted for existing plus project and 2040 cumulative conditions. The existing plus project conditions assess the near-term impacts of the proposed project, while 2040 cumulative conditions assess the near-term and long-term impacts of the proposed project in combination with cumulative development. The 2040 cumulative analysis incorporates data and forecasts from the City's SF-CHAMP travel demand model in the analysis of VMT impacts, while all other cumulative transportation impacts are assessed based on a review of the cumulative projects (a list-based approach) that are located within the project's study area (see **EIR Section 3.A**, pp. 3.A.6 to 3.A.8, and **Figure 3.A.1**, p. 3.A.9, for, respectively, a detailed description of these projects and a map of their locations).

In San Francisco, the weekday extended p.m. peak period (Tuesday, Wednesday, or Thursday, 3 p.m. to 7 p.m.) is typically the period when the most overall travel happens. Although a substantial amount of travel occurs throughout the day, impacts from projects would typically be less during other periods for most topics, and therefore the impact assessment focuses on the p.m. peak period (defined as 4 p.m. to 6 p.m.). The peak periods for the transit facility occur in the early morning (i.e., between 4 a.m. and 7 a.m.) and in the late evening (i.e., between 7 p.m. and 9 p.m.) when travel by the residential and retail land uses is very low. Most travel associated with the proposed project would be generated by the residential and retail land uses, which generate the most trips during the p.m. peak period. The analysis period for assessing loading impacts is the 11 a.m. to 1 p.m. period for commercial vehicle loading activities and the 4 p.m. to 6 p.m. period for passenger vehicle loading activities.

Project Travel Demand Methodology and Results

Project travel demand refers to the number, type, and common destinations of new trips that people would take to and from the project. The memorandum containing the detailed methodology and results for the project travel demand is included in **EIR Appendix E-4, Travel Demand Memorandum**.[27] This section summarizes information and analysis contained in the travel demand memorandum and presents the estimates of project-generated person trips[28] by the various ways of

[27] Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

[28] A person trip is a trip made by one person by any means of transportation (vehicle, transit, walking, bicycling, etc.).

travel, as well as the project-generated vehicle trips. In addition, this section presents the estimation of the demand for loading spaces to accommodate project-generated delivery and service vehicles and passenger loading activities.

EXISTING SITE TRIPS

The project site occupies the equivalent of roughly two typical city blocks. The western half is occupied by an asphalt-paved bus storage yard, including a bus wash area and running repair station, while the eastern half is occupied by the maintenance and operations building, including a second-floor parking deck. The facility currently houses and maintains 158 trolley coaches. Vehicular access is currently provided by a driveway on 17th Street for access to the second story of the maintenance and operations building and rooftop parking, and by three driveways on Mariposa Street for all other purposes. There are about 400 total employees, including 295 bus operators, at the facility.

- On a daily basis, there are 952 total vehicles entering and exiting the four existing driveways for the facility (183 inbound and 187 outbound via 17th Street, and 290 inbound and 292 outbound on Mariposa Street).[29] Of the 952 daily vehicles, 32 percent are buses, and 68 percent are autos and trucks. In addition, there are eight bicycle trips and 395 pedestrian trips made to and from the site, for a total of 1,202 daily person trips.
- Because many employees park on surrounding streets and therefore do not use the facility's existing driveways, an additional 295 vehicle trips are associated with the project, resulting in a total of 1,247 vehicle trips generated by the existing uses at the project site, including 302 bus trips.
- During the 4 p.m. to 6 p.m. peak period, the greatest number of trips entering and exiting the facility occurs between 4:30 p.m. and 5:30 p.m. (10 autos and trucks, four buses, two bicycles, and 15 pedestrians), which represents 1 percent of the daily total vehicle count and 2 percent of daily person trips.
- The peak hour for vehicle activity to and from the site occurs from 5:45 a.m. to 6:45 a.m., with 73 auto and truck trips, 42 bus trips, and 45 pedestrian trips, representing 12 percent of total daily vehicle activity and 11 percent of daily person trips.

PROJECT TRIPS

The travel demand methodology consists of four steps: 1) trip generation, 2) ways people travel, 3) common destinations, and 4) assignment. The following summarizes each of these steps.

Step 1. Trip Generation

Trip generation refers to the number of estimated trips people would take to and from the project, regardless of the way they travel (see step 2 below). The following applies person trip generation rates, accounting for the size and type of land use, to estimate the number of project person trips.

[29] Field data collection was conducted on Thursday, May 31, 2018, and Thursday, March 12, 2020.

As presented in **EIR Chapter 2, Project Description**, the proposed project would modernize and expand the existing Potrero Yard transit facility to accommodate 213 trolley buses (an increase of 55 buses from the 158 buses currently accommodated) and 18 maintenance bays, as well as 52,000 gross square feet of new administrative, training, and office space. The number of employees reporting to the facility on a daily basis would increase from 400 employees under existing conditions to 829 employees under the proposed project. The proposed project would also include a joint development component of up to 575 residential units, of which a substantial percentage would be below-market or affordable units, and 33,000 gross square feet of ground-floor commercial/retail uses.

Total person trip generation was calculated for each project component (i.e., the transit facility and the joint development components) and individual land uses. The person trip generation estimates for the proposed project include residents, employees, and visitors associated with the proposed land uses. Trip generation rates for the residential and retail uses within the joint development, and the administrative, training, and office uses within the transit facility were based on the 2019 SF Guidelines trip generation information.

The travel demand for the bus maintenance and storage and bus operations uses within the transit facility was based on trip generation rates developed from vehicle and pedestrian counts and observations at the existing facility.

- Person trip generation rates for the existing **bus maintenance and storage** use were determined by dividing the person trips obtained from field counts by the total number of onsite employees (including bus operators).[30]
- The vehicle trip rates for existing **bus operations** (i.e., activity of revenue service vehicles/buses traveling to and from the site) were developed by dividing the daily and p.m. peak hour bus trips by the total number of buses accommodated at the existing facility (i.e., 158 buses).

Because the proposed project would replace an existing active transit facility, a credit was applied to the new trip generation to determine the **net-new** trips by way of travel and vehicle trips that would be added to the adjacent transportation network. The credit was determined from counts of people and vehicles entering and exiting the existing facility, as described above.

Table 3.C.7: Proposed Project Net-New Person Generation by Land Use summarizes the daily and weekday p.m. peak hour person trips by proposed project component. The proposed project would generate a total of 10,254 net-new person trips on a daily basis and 870 net-new person trips during the weekday p.m. peak hour. As shown in the table, the majority of the net-new daily and p.m. peak hour person trips would be generated by the residential and retail uses.

[30] Ways of travel data from SF Guidelines and SFMTA were applied to the vehicle field counts traveling to and from the facility to estimate total person trips by all ways of travel at the existing facility. This allows for the inclusion of employees walking, bicycling, or taking transit, and those employees who may drive and park off-site and walk between the site and their parking location.

Table 3.C.7: Proposed Project Net-New Person Trip Generation by Land Use – Daily and Weekday P.M. Peak Hour

Project Component/Land Use	Daily	P.M. Peak Hour
Transit Facility		
Administrative and Office	816	73
Bus Maintenance and Storage [NOTE A]	1,923	45
Credit for Existing Use	1,202	28
Subtotal Net-New Transit Facility	**1,537**	**90**
Joint Development		
Residential	3,767	335
Retail	4,950	446
Subtotal Joint Development	**8,717**	**780**
Total Project Net-New Person Trips [NOTE B]	***10,254***	***870***

Notes:
[A] Muni buses traveling to and from the facility were not included in person trip generation. Bus driver trips to and from work at the facility were included in the bus maintenance and storage use.
[B] Numbers may not sum to total due to rounding.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

Step 2. Ways People Travel

Ways people travel, also known as mode split or travel mode, refer to the estimated way or method people travel (e.g., walking, bicycling, etc.). The person trips estimated in step 1 were independently allocated to ways of travel to determine the number of trips by auto/truck, taxi/ transportation network companies' (TNC) vehicles, transit, walking, and bicycling. The "auto" mode includes persons traveling by private auto and carpool, as well as commercial vehicle traffic (i.e., pickup trucks and other trucks) generated by the project. The "taxi/TNC" mode includes taxis and app-based ride hailing services (e.g., Uber, Lyft), etc. The "transit" mode includes individuals traveling by local and regional public transit. The number of vehicle trips generated by the project is estimated by dividing the person trips by auto way of travel by the average vehicle occupancy to account for carpooling (thereby resulting in a fewer number of vehicle trips than person trips by auto, taxi/TNC, and buses).

Table 3.C.8: Proposed Project Ways of Travel by Land Use provides the estimated percentage of daily and weekday p.m. peak period project trips by different ways of travel (e.g., walking, bicycling, transit, etc.). These trip numbers by mode account for the geographic location of the project site, and reflect travel survey of SFMTA employees for the transit facility component. Overall, during the weekday p.m. peak hour, 37 percent of the net-new trips would occur by auto and taxi/TNC, 17 percent by transit, 43 percent by walking, and 3 percent by bicycling. During the weekday p.m. peak hour, the proposed project would generate 226 net-new vehicle trips, and the majority of the vehicle trips would be by auto (i.e., as opposed to bus or taxi/TNC trips).

Table 3.C.8: Proposed Project Ways of Travel by Land Use – Daily and Weekday P.M. Peak Hour

	Daily			P.M. Peak Hour		
Trip Type/Way of Travel	**Transit Facility**	**Joint Development**	**Total**	**Transit Facility**	**Joint Development**	**Total**
Person Trips						
Auto	69%	32%	41%	51%	32%	34%
Taxi/TNC	6%	2%	3%	9%	2%	3%
Transit	15%	15%	15%	24%	15%	17%
Walk	9%	48%	38%	14%	48%	43%
Bicycle	1%	3%	3%	2%	3%	3%

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

Table 3.C.9: Proposed Project Net-New Trip Generation by Way of Travel summarizes the weekday daily and p.m. peak hour person trips by way of travel for the proposed project components and provides the estimated number of vehicle trips.

Table 3.C.9: Proposed Project Net-New Trip Generation by Way of Travel – Weekday Daily and P.M. Peak Hour

	Daily			P.M. Peak Hour		
Trip Type/Way of Travel	**Transit Facility**	**Joint Development** NOTE A	**Total**	**Transit Facility**	**Joint Development** NOTE A	**Total**
Person Trips						
Auto	1,903	2,747	4,650	60	246	306
Taxi/TNC NOTE B	156	201	357	11	18	29
Transit	402	1,340	1,742	29	120	149
Walk	256	4,143	4,399	17	371	388
Bicycle	23	285	308	2	26	28
Credit for Existing Uses Trips NOTE C	(1,202)	n/a	(1,202)	(28)	n/a	(28)
Net-New Person Trips NOTE D	**1,537**	**8,717**	**10,254**	**91**	**781**	**872**
Vehicle Trips						
Auto	1,567	1,839	3,406	49	155	204
Taxi/TNC NOTE B	372	270	642	22	22	44
Buses (Transit Facility)	407	0	407	5	0	5
Credit for Existing Uses Trips NOTE C	(1,247)	n/a	(1,247)	(27)	n/a	(27)
Net-New Vehicle Trips NOTE D	**1,099**	**2,109**	**3,208**	**49**	**177**	**226**

Notes:
A Because the residential and retail uses would be a new use at the project site, the application of a credit is not applicable (n/a).
B Taxi/TNC trips were doubled to account for separate vehicle trips to and from the project site.
C Person trips by all ways of travel, and vehicle trips include autos, trucks, taxi/TNC vehicles, and buses.
D Numbers may not sum to total due to rounding.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

The transit facility would generate few trips during the p.m. peak hour, and these would be associated with the administrative, training, and office uses. Buses generally leave the yard to

access their route between 4 a.m. and 7 a.m., and return to the yard in the evening between 7 p.m. and 9 p.m., and therefore most employees work non-standard shifts. Thus, the majority of morning employee commute trips occur before the typical a.m. peak period, and the majority of evening commute trips occur after the typical p.m. peak period.

Table 3.C.10: Proposed Project Net-New Vehicle Trip Generation by Vehicle Type and Direction summarizes the daily and weekday p.m. peak hour vehicle trips disaggregated by vehicle type, including private autos, taxi/TNC, and bus operations. In addition, the direction of travel relative to the project site is presented (i.e., inbound to the site or outbound from the site).

The proposed project would generate 3,208 net-new daily vehicle trips (1,620 inbound and 1,589 outbound) and 226 net-new weekday p.m. peak hour vehicle trips (130 inbound and 96 outbound). These net-new trips represent the new vehicle trips that would be added to the roadway network after accounting for the existing bus and maintenance activity at the site.

Table 3.C.10: Proposed Project Net-New Vehicle Trip Generation by Vehicle Type and Direction –Daily and Weekday P.M. Peak Hour

	Daily			P.M. Peak Hour		
Project Component/Vehicle Type	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Transit Facility [A]						
Auto [B]	782	785	1,567	12	37	49
Taxi/TNC [C]	186	186	372	11	11	22
Bus	204	204	407	2	4	5
Credit for Existing Use Trips [D]	(620)	(627)	(1,247)	(9)	(18)	(27)
Subtotal Net-New Transit Facility	**552**	**548**	**1,099**	**15**	**34**	**49**
Joint Development [A]						
Auto [B]	933	906	1,839	104	51	155
Taxi/TNC [C]	135	135	270	11	11	23
Subtotal Joint Development	**1,068**	**1,041**	**2,109**	**115**	**62**	**177**
Total Project Net-New Vehicle Trips	***1,620***	***1,589***	***3,208***	***130***	***96***	***226***

Notes:
[A] Numbers may not sum to total due to rounding.
[B] Auto includes maintenance vehicles, including trucks.
[C] Taxi/TNC trips were doubled to account for separate vehicle trips to and from the project site.
[D] Credit for existing transit facility use based on counts of vehicle and person trips conducted in February 2020 in conjunction with employee travel survey data collected by SFMTA. Existing vehicle credit accounts for autos, commercial vehicles, taxi/TNC vehicles, and buses.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

Step 3. Common Destinations

Common destinations, also known as trip distribution, refers to the estimated number of trips people would take to (inbound) and from (outbound) the project site and another place (e.g., another neighborhood). The person and vehicle trips estimated in the previous step were then distributed to various points of trip origin or destination, inbound and outbound, for each of the project's specific land use, and account for the geographic location of the project site. Specifically, the trips origins

and destinations were allocated to the eight San Francisco neighborhoods and the East Bay, North Bay, and South Bay. **Table 3.C.11: Proposed Project Vehicle and Transit Person Trip Distribution by Place of Origin or Destination** provides the estimated percentage of weekday p.m. peak hour project vehicle and transit trips to the common destinations.

Table 3.C.12: Proposed Project Net-New Vehicle and Transit Trip Generation by Place of Origin summarizes the inbound and outbound vehicle and transit person trips for the weekday p.m. peak hour by place of origin. As shown in **Table 3.C.12,** the majority of the project-generated vehicle and transit person trips would be within San Francisco; the largest proportion of vehicle trips would be to and from the Mission/Potrero and Outer Mission/Hills neighborhoods, and the largest proportion of transit person trips would be to and from the Downtown/North Beach and Outer Mission/Hills neighborhoods. As shown on **Table 3.C.12**, during the weekday p.m. peak hour, more transit person trips (97 inbound and 52 outbound) and vehicle trips (130 inbound and 96 outbound) would be inbound to the project site than outbound from the project site.

Table 3.C.11: Proposed Project Vehicle and Transit Person Trip Distribution by Place of Origin – Weekday P.M. Peak Hour

Place of Trip Origin or Destination	Vehicle Trips [NOTE A]	Transit Person Trips
San Francisco		
Downtown/North Beach	8%	23%
South of Market	2%	6%
Marina/Western Market	10%	11%
Mission/Potrero Hill	37%	14%
Outer Mission/Hills	13%	21%
Bayshore	2%	2%
Richmond	1%	0%
Sunset	2%	1%
Treasure Island	0%	0%
South Bay	15%	12%
East Bay	7%	7%
North Bay	1%	1%
Total [NOTE B]	**100%**	**100%**

Notes:
[A] Vehicle trips include autos, trucks, taxi/TNC vehicles, and buses.
[B] Numbers may not sum to total due to rounding.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

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Table 3.C.12: Proposed Project Net-New Vehicle and Transit Person Trip Generation by Place of Origin – Weekday P.M. Peak Hour

Place of Trip Origin or Destination	Vehicle Trips [NOTE A]			Transit Person Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total
San Francisco						
Downtown/North Beach	13	7	20	30	5	35
South of Market	3	2	5	0	9	9
Marina/Western Market	21	3	24	12	5	17
Mission/Potrero Hill	51	33	84	9	12	21
Outer Mission/Hills	16	14	30	31	1	32
Bayshore	2	3	5	2	1	3
Richmond	2	0	2	0	0	0
Sunset	4	1	5	0	2	2
Treasure Island	0	0	0	0	0	0
South Bay	15	19	34	10	8	18
East Bay	4	11	15	3	8	11
North Bay	0	2	2	0	2	2
Total Trips [NOTE B]	**130**	**96**	**226**	**97**	**52**	**149**

Notes:
[A] Vehicle trips include autos, trucks, taxi/TNC vehicles, and buses.
[B] Numbers may not sum to total due to rounding.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

Step 4. Assignment

Assignment refers to the location of assignment of project vehicle trips to adjacent streets, to loading zones, and driveways. The project-generated vehicle trips and directional distribution obtained in the previous steps were then used as the basis for assigning vehicle trips to the local streets in the study area, specifically:

- Vehicular access for buses, maintenance vehicles, and deliveries for the transit facility would remain on Mariposa Street and the net-new vehicle trips were assigned to the proposed new driveways on Mariposa Street.
- Taxi/TNC trips associated with the transit facility and joint development uses were assigned to the proposed passenger loading zone on Bryant Street adjacent to the project site. The taxi/TNC vehicle estimates assume that each trip would generate a separate inbound and outbound vehicle trip (i.e., the vehicle trips by taxi/TNC were doubled to reflect localized traffic created by taxi/TNC vehicles inbound to the site to pick up someone and outbound after dropping someone off, or vice versa).
- The proposed project would not provide any onsite vehicle parking for the residential or retail uses (with the exception of 12 public car-share parking spaces within the basement level). As a conservative assumption, all other new vehicle trips associated with the joint development were assigned to and from Mariposa Street. Because onsite parking would not be provided, most drivers would park further from the project site in on-street spaces. This may generate additional vehicle activity in the surrounding neighborhood due to drivers searching for parking.

Figure 3.C.4: Project Vehicle Trip Assignment Weekday P.M. Peak Hour presents the weekday p.m. peak hour vehicle trip assignment at the seven study intersections.

PROJECT LOADING DEMAND

Loading demand consists of the estimated number of project delivery, service, and passenger vehicle trips, and is shown in **Table 3.C.13: Proposed Project Freight and Passenger Loading Demand by Land Use**. The 2019 SF Guidelines methodology for estimating commercial vehicle and freight loading demand and passenger loading demand was used to calculate the peak hour loading space demand. See **EIR Appendix E-4**.

Table 3.C.13: Proposed Project Freight and Passenger Loading Demand by Land Use

	Freight Loading [NOTE A]		Passenger Loading [NOTE B]	
Land Use	**Daily Delivery and Service Vehicles**	**Peak Hour Loading Space Demand**	**P.M. Peak Hour Loading Instances**	**P.M. Peak Hour Peak Minute Loading Space Demand**
Transit Facility				
Administrative & Office	11	1	10	**1**
Bus Maintenance & Storage	n/a	n/a	4	
Joint Development				
Residential	16	1	24	**1**
Retail	7	1	14	
Total [NOTE C]	**34**	**3**	**52**	**2**

Notes:

[A] Freight loading demand is presented as the number of delivery and service vehicle trips per time period. The peak period of freight loading demand typically occurs between 10 a.m. and 1 p.m. and does not coincide with the weekday a.m. or p.m. peak periods.

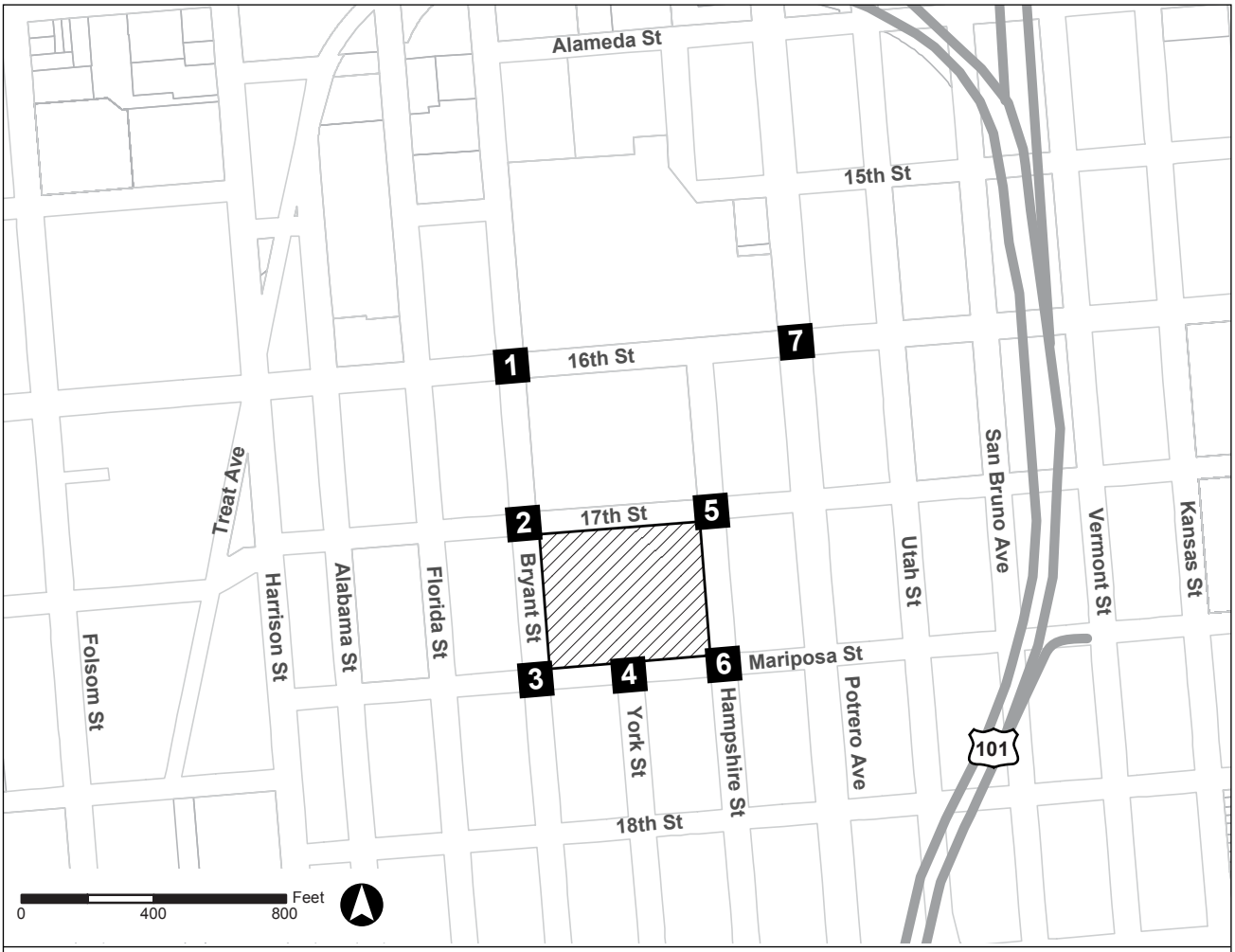
[B] Passenger loading is presented as the passenger loading trips estimated to occur during the p.m. peak period. The peak period of passenger loading demand generally occurs during the extended weekday p.m. peak period of 3 p.m. to 7 p.m. The passenger loading space demand is presented for the peak one minute of the peak 15 minutes of the p.m. peak hour.

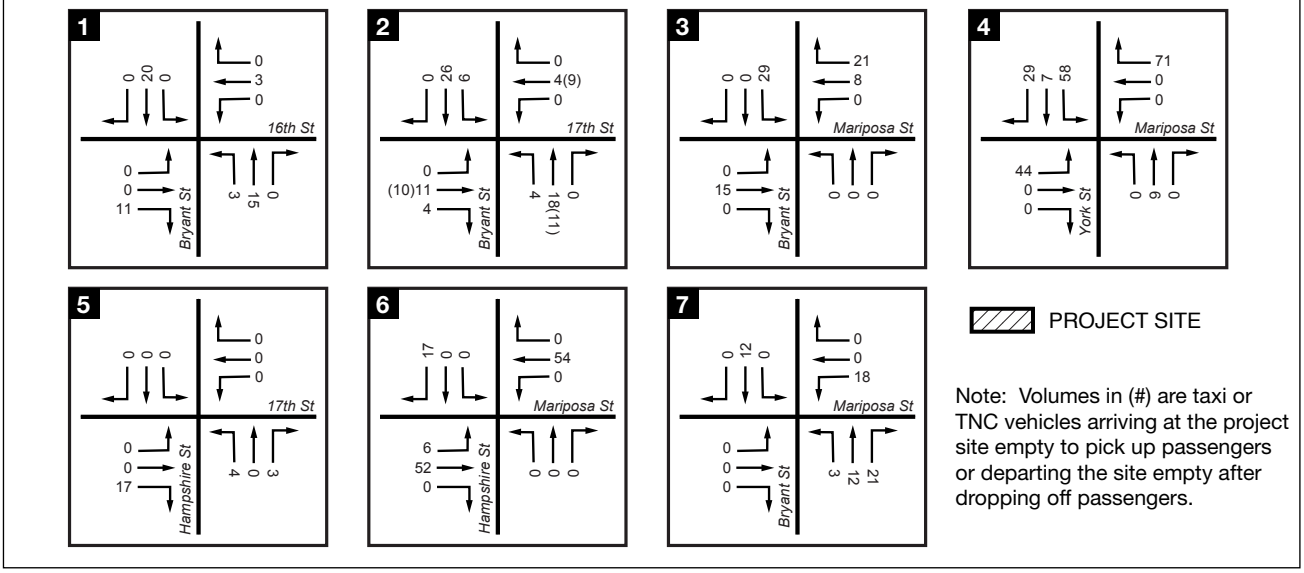
[C] The delivery and service vehicle trips, passenger loading instances, and the freight and passenger loading space demand for each land use were rounded up to whole numbers, and therefore the totals may not sum due to rounding.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

The administrative/office, residential, and retail uses would generate a total of 34 delivery and service vehicle trips per day, which corresponds to a demand for three loading spaces during the peak hour of loading activities (generally between 10 a.m. and 1 p.m.). A specific estimate of the loading demand of the bus maintenance and bus operations was not determined, as these loading activities would be accommodated off-street within the transit facility's square footage allocated to these uses (i.e., these types of deliveries would likely not be conducted in the onsite loading spaces for the administrative/office, residential, and retail uses).

The proposed project would also generate about 52 loading instances during the p.m. peak hour, which corresponds to a demand for two spaces of passenger loading during any one minute of the peak 15 minutes of loading activities.





Source: Fehr & Peers/LCW Consulting, 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 3.C.4: PROJECT VEHICLE TRIP ASSIGNMENT WEEKDAY P.M. PEAK HOUR

Employee and Family Support Variant Travel Demand

The Employee and Family Support Variant would replace 9,000 of the 33,000 square feet of commercial retail uses included in the proposed project with childcare uses, and therefore the trip generation for this variant would be different than for the proposed project. Travel demand for the Employee and Family Support Variant was estimated consistent with the methodology presented above for proposed project, and travel demand calculations for this project variant are included in **EIR Appendix E-4**.

Table 3.C.14: Employee and Family Support Variant Net-New Vehicle Trip Generation by Way of Travel summarizes the daily and p.m. peak hour person trips disaggregated by way of travel for each component (i.e., transit facility, joint development), and also presents vehicle trips.

Table 3.C.14: Employee and Family Support Variant Net-New Trip Generation by Way of Travel – Weekday Daily and P.M. Peak Hour

	Daily			P.M. Peak Hour		
Trip Type/Way of Travel	**Transit Facility**	**Joint Development** NOTE A	**Total**	**Transit Facility**	**Joint Development** NOTE A	**Total**
Person Trips						
Auto	1,903	2,528	4,430	60	262	322
Taxi/TNC NOTE B	156	188	344	11	19	30
Transit	402	1,177	1,579	29	115	144
Walk	256	3,395	3,650	17	312	329
Bicycle	23	250	273	2	23	25
Credit for Existing Uses Trips NOTE C	(1,202)	n/a	(1,202)	(28)	n/a	(28)
Net-New Person Trips	**1,537**	**7,537**	**9,075**	**91**	**732**	**822**
Vehicle Trips						
Auto	1,567	1,795	3,362	49	203	252
Taxi/TNC NOTE B	372	258	630	22	26	48
Buses (Transit Facility)	407	0	407	5	0	5
Credit for Existing Uses Trips NOTE C	(1,247)	n/a	(1,247)	(27)	n/a	(27)
Net-New Vehicle Trips	**1,099**	**2,053**	**3,152**	**49**	**229**	**278**

Notes: Numbers may not sum to total due to rounding.

A Because the residential and retail uses would be a new use at the project site, the application of a credit is not applicable (n/a). A trip reduction factor of 30 percent was applied to the childcare land use, because the childcare facility would serve transit facility employees and joint development residents and employees, as well as be available to the general public.

B Taxi/TNC trips were doubled to account for separate vehicle trips to and from the project site.

C Person trips by all ways of travel, and vehicle trips include autos, trucks, taxi/TNC vehicles, and buses.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4**.

During the p.m. peak hour the Employee and Family Support Variant would generate about 5 percent fewer net-new person trips by all ways of travel than the proposed project (822 person trips for this variant and 872 person trips for the proposed project), but 23 percent more net-new p.m. peak hour vehicle trips than the proposed project (278 vehicle trips for this variant and

226 vehicle trips for the proposed project). This variant includes an increase in vehicle trips due to the nature of childcare pick-up and drop-off activities, wherein parents/guardians drive both to and from the site during the peak hour, resulting in both one inbound and one outbound trip.

Loading demand for this variant is presented in **Table 3.C.15: Employee and Family Support Variant Freight and Passenger Loading Demand by Land Use**. Freight loading demand for this variant would remain the same as for the proposed project (a demand for three loading spaces during the peak hour of loading activities); however, the passenger loading space demand would increase due to the introduction of the childcare uses. The passenger loading duration for a childcare use is typically longer than for other uses, with observations at sites serving kindergartens showing a duration of between two and five minutes. The Employee and Family Support Variant would generate about 81 loading instances during the p.m. peak hour, which corresponds to a demand for eight spaces of passenger loading during any one minute of the peak 15 minutes of loading activities (compared to 52 loading instances and a demand for two spaces for passenger loading for the proposed project). During the p.m. peak hour, the childcare use would generate a demand for six of the eight spaces of passenger loading.

Table 3.C.15: Employee and Family Support Variant Freight and Passenger Loading Demand by Land Use

	Freight Loading [NOTE A]		**Passenger Loading** [NOTE B]	
Land Use	**Daily Delivery and Service Vehicles**	**Peak Hour Loading Space Demand**	**P.M. Peak Hour Loading Instances**	**P.M. Peak Hour Peak Minute Loading Space Demand**
Transit Facility				
Administrative & Office	11	1	10	**1**
Bus Maintenance & Storage	n/a	n/a	4	
Joint Development				
Residential	16	1	24	**1**
Retail	6	1	10	
Childcare [NOTE C]			33	**6**
Total [NOTE D]	**34**	**3**	**81**	**8**

Notes:

[A] Freight loading demand is presented as the number of delivery and service vehicle trips per time period. The peak period of freight loading demand typically occurs between 10 a.m. and 1 p.m. and does not coincide with the weekday a.m. or p.m. peak periods.

[B] Passenger loading is presented as the passenger loading trips estimated to occur during the p.m. peak period. The peak period of passenger loading demand generally occurs during the extended weekday p.m. peak period of 3 p.m. to 7 p.m. which includes the typical afternoon pick-up period for childcare facilities. The passenger loading space demand is presented for the peak one minute of the peak 15-minutes of the p.m. peak hour.

[C] Loading duration for childcare is assumed to be five minutes, compared to one minute for all other uses.

[D] The delivery and service vehicle trips, passenger loading instances, and the freight and passenger loading space demand for each land use were rounded up to whole numbers, and therefore the totals may not sum due to rounding.

Source: Technical Memorandum – Travel Demand Estimates for the Potrero Yard Modernization Project, August 2020. See **EIR Appendix E-4.**

Construction Impacts

The analysis for addressing project construction impacts uses preliminary project construction information. The evaluation addresses the staging and duration of construction activities, estimated daily worker and truck trips, truck routes, and roadway and/or sidewalk closures, and evaluates the effects of construction activities on people walking, bicycling, driving, or riding public transit, as well as the effects on emergency vehicle operators.

Operational Impacts

The following describes the methodology for analysis of operational impacts, by significance criterion.

POTENTIALLY HAZARDOUS CONDITIONS

A "hazard" refers to a project-generated vehicle potentially colliding with a person walking, bicycling, or driving or public transit vehicle that could cause serious or fatal physical injury, accounting for the aspects described below. Human error or non-compliance with laws, weather conditions, time of day, and other factors can affect whether a collision could occur. However, for purposes of CEQA, hazards refer to engineering aspects of a project (e.g., speed, turning movements, complex designs, substantial distance between street crossings, sightlines) that may cause a greater risk of collisions that result in serious or fatal physical injury than a typical project. This analysis focuses on hazards that could reasonably stem from the project itself, beyond collisions that may result from aforementioned non-engineering aspects or the transportation system as a whole.

Therefore, the methodology qualitatively addresses the potential for the project to exacerbate an existing or create a new potentially hazardous condition to people walking, bicycling, or driving, or public transit operations. The methodology accounts for the number, movement type, sightlines, and speed of project vehicle trips and project changes to the public right-of-way in relation to the presence of people walking, bicycling, or driving.

ACCESSIBILITY

The methodology qualitatively addresses the potential for the project to interfere with the accessibility of people walking or bicycling or result in inadequate emergency access. The methodology accounts for the number, movement type, sightlines, and speed of project vehicle trips and project changes to the public right-of-way in relation to the presence of people walking and bicycling or emergency service operator facilities.

PUBLIC TRANSIT DELAY

The planning department uses a quantitative threshold of significance and qualitative criteria to determine whether the project would substantially delay public transit. For individual routes, if the project would result in transit delay greater than or equal to four minutes, then it might result in a significant impact. For individual Muni routes with headways less than eight minutes, the department may use a threshold of significance less than four minutes.[31] For individual surface routes operated by regional agencies, if the project would result in transit delay greater than one-half headway, then it might result in a significant impact. For determining whether a delay would result in significant impacts due to a substantial number of people riding transit switching to riding in private or for-hire vehicles, the department considers the following qualitative criteria: transit service headways and ridership, origins and destinations of trips, availability of other transit and modes, and competitiveness with private vehicles.

VMT ANALYSIS METHODOLOGY

Land Use Components

The department uses the following quantitative thresholds of significance to determine whether the project would generate substantial additional VMT:

- For residential projects, if it exceeds the regional household VMT per capita minus 15 percent
- For office projects, if it exceeds the regional VMT per employee minus 15 percent
- For retail projects, if it exceeds the regional VMT per retail employee minus 15 percent[32]
- For mixed-use projects, evaluate each land use independently, per the thresholds of significance described above

The department uses VMT efficiency metrics (per capita or per employee) for thresholds of significance. VMT per capita reductions mean that individuals will, on average, travel less by automobile than previously but, because the population will continue to grow, it may not mean an overall reduction in the number of miles driven.

[31] The threshold uses the adopted Transit First Policy. City Charter section 8A.103 85 percent on-time performance service standard for Muni. With the charter considering vehicles arriving more than four minutes beyond a published schedule time as late.

[32] Retail travel is not explicitly captured in San Francisco chained activity modeling process; rather, there is a generic "Other" purpose which includes retail shopping, medical appointments, visiting friends or family, and all other non-work, non-school tours. The retail efficiency metric captures all of the "Other" purpose travel generated by Bay Area households. The denominator of employment (including retail employment; cultural, institutional, and educational employment; medical employment; school enrollment; and number of households) represents the size, or attraction, of the zone for this type of "Other" purpose travel.

The department uses a map-based screening criterion to identify types and locations of land use projects that would not exceed these quantitative thresholds of significance. The San Francisco County Transportation Authority uses a travel demand model to present VMT for residential, office, and retail in San Francisco and the region, as described and shown under existing conditions. The department uses that data and associated maps to determine whether a project site's location is below the VMT quantitative threshold of significance.

Further, the department presumes residential, retail, and office projects, and projects that are a mix of these uses, proposed within 0.5 mile of an existing major transit stop (as defined by CEQA section 21064.3) or an existing stop along a high-quality transit corridor (as defined by CEQA section 21155) would not exceed these quantitative thresholds of significance. However, this presumption would not apply if the project would: (1) have a floor area ratio of less than 0.75; (2) include more parking for use by residents, customers, or employees of the project than required or allowed, without a conditional use; or (3) is inconsistent with the applicable Sustainable Communities Strategy.[33]

Transportation Components

The department uses the following quantitative threshold of significance and screening criteria to determine whether transportation projects may substantially induce additional automobile travel: 2,075,220 VMT per year. This threshold is based on the fair share VMT allocated to transportation projects required to achieve California's long-term greenhouse gas emissions reduction goal of 40 percent below 1990 levels by 2030.

The department uses a list of transportation components that would not exceed this quantitative threshold of significance. If a project fits within the general types of projects (including combinations of types) listed below, then the department presumes that VMT impacts would be less than significant:

- Active Transportation, Rightsizing, and Transit Projects
  - Infrastructure projects, including safety and accessibility improvements for people walking or bicycling
  - Installation or reconfiguration of traffic calming devices
- Other Minor Transportation Projects
  - Rehabilitation, maintenance, replacement, and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and bicycle and pedestrian facilities) that do not add additional motor vehicle capacity
  - Addition of transportation wayfinding signage

[33] The department considers a project to be inconsistent with the Sustainable Communities Strategy if the project is located outside of areas contemplated for development in the Sustainable Communities Strategy.

- Removal of on-street parking spaces
- Adoption, removal, or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)

LOADING METHODOLOGY

The methodology assesses the potential for convenient off- and on-street loading facilities to meet the project's loading demand during the average peak period. For the purposes of this section, convenient refers to facilities within 250 linear feet of the project site. If convenient loading facilities meet the estimated demand, the analysis is complete. If convenient loading facilities do not meet the demand, then the methodology qualitatively addresses the potential for the project to exacerbate an existing or create a new potentially hazardous condition to people walking, bicycling, or driving or substantially delay public transit.

2040 Cumulative Conditions

The 2040 cumulative conditions assess the long-term impacts of the project in combination with other cumulative projects. The following summarizes future year modeling and cumulative projects relevant to transportation topics. In addition, the following summarizes differences between existing plus project and these future year conditions regarding the methodology for analyzing any quantitative thresholds of significance for determining transportation impacts.

2040 Modeling

The cumulative conditions analysis incorporates data and forecasts from the City's SF-CHAMP travel demand model outputs in the analysis of VMT impacts. The model is an activity-based travel demand model that the transportation authority calibrates to represent future transportation conditions in San Francisco, accounting for assumptions regarding cumulative infrastructure projects and population growth. Inputs to the model include:

- Infrastructure projects listed in Plan Bay Area (2017);
- Infrastructure projects listed in San Francisco's Countywide Transportation Plan, Capital Plan, or a San Francisco agency's (e.g., SFMTA) Capital Improvement Program and anticipated for completion between 2020 and 2040;
- Infrastructure, private development, or area plan projects actively undergoing environmental review, recently completed environmental review, or the department anticipates undertaking environmental review in the near future because they have received sufficient project definition; or

- Land use growth assumptions derived from the Jobs-Housing-Connections projections developed by the Association of Bay Area Governments/Metropolitan Transportation Commission.[34]

2040 Cumulative Projects

The cumulative conditions analysis for transportation topics other than VMT uses a list-based approach. The geographic context for the analysis of cumulative transportation impacts generally includes the sidewalks and roadways adjacent to the project site, and the local roadway and transit network within 0.5 mile of the project site. The discussion of cumulative transportation impacts assesses the degree to which the proposed project would affect the transportation network in conjunction with overall citywide growth and other cumulative projects. The following describes cumulative land development and transportation projects that the analysis uses to assess cumulative impacts.

DEVELOPMENT PROJECTS

The list of cumulative development projects located within 0.25 mile of the project site that are considered in the transportation analysis is presented in **Table 3.A.1: Cumulative Projects**, p. 3.A.7. Of the 11 cumulative development projects, the 2601 Mariposa Street project (currently under construction) and the 1850 Bryant Street project are located across the street from the project site. The remaining nine cumulative projects are not in the immediate vicinity of the project site.

TRANSPORTATION PROJECTS

The cumulative conditions analysis also considers the effects of foreseeable changes to the transportation network. In the project vicinity, the 16th Street Improvement Project is currently under construction and planning for the SFMTA Northeast Mission Parking Management Plan has recently been initiated. In addition to these projects, the cumulative conditions analysis also incorporates the effects of other major projects that are citywide or regional in scope, even though they would not directly affect the transportation network in the vicinity of the project site. Projects such as Muni Forward, the Caltrain Modernization Program, expanded ferry service from the Water Emergency Transportation Authority (WETA), and various upgrades to BART would affect transit service and capacity and have been accounted for in the latest SF-CHAMP model runs.

Construction Impacts

The analysis for addressing project construction impacts uses preliminary project construction information from the following cumulative projects: 2601 Mariposa Street and 1850 Bryant Street

[34] The analysis used the Central SoMa Plan Model Run. Documentation, including input assumptions, is included in the Transportation Impact Analysis Guidelines – Supplementary Guidance Memorandum on pp. 16-21, *https://default.sfplanning.org/publications_reports/TIA_Guidelines_Supplementary_Guidance_Memo.pdf*, accessed May 5, 2021.

projects. The evaluation uses the same methodology as described above for existing plus project conditions.

Operational Impacts

The following describes the methodology for cumulative analysis of operational impacts, by significance criterion. If the combined projects would result in a significant cumulative impact, the 2040 cumulative conditions assess the project's contribution to that impact.

POTENTIALLY HAZARDOUS CONDITIONS

The analysis for addressing potentially hazardous conditions uses information from a subset of cumulative projects identified in **Table 3.A.1** and shown on **Figure 3.A.1: Cumulative Projects**, including the 2601 Mariposa Street and 1850 Bryant Street projects. (See **EIR Section 3.A**, pp. 3.A.7 - 3.A.9.) The evaluation uses the same methodology as described above on p. 3.C.29 for existing plus project conditions.

ACCESSIBILITY

The analysis for addressing interference or inadequate access uses information from a subset of cumulative projects identified in **Table 3.A.1**, including the 2601 Mariposa Street and 1850 Bryant Street projects. The evaluation uses the same methodology as described on p. 3.C.29 for existing plus project conditions.

PUBLIC TRANSIT DELAY

The analysis for addressing public transit delay uses information from the cumulative projects identified in **Table 3.A.1**. Cumulative impacts related to transit delay were assessed qualitatively based on the same methodology as described above on pp. 3.C.29-3.C.31 for existing plus project conditions.

VMT ANALYSIS

VMT by its nature is largely a cumulative impact. The number and distance of vehicular trips associated with past, present, and future projects might cause or contribute to the secondary physical environmental impacts associated with VMT. It is likely that no single project by itself would be sufficient in size to prevent the region or state in meeting its VMT reduction goals. Instead, a project's individual VMT contributes to cumulative VMT impacts. The department uses existing plus project-level thresholds of significance based on levels at which the department does not anticipate new projects to conflict with state and regional long-term greenhouse gas emission reduction targets and statewide VMT per capita reduction targets.

Therefore, the department assesses whether the region is estimated to meet its long-term greenhouse gas emission reduction targets to determine if a cumulative impact would occur. If a cumulative impact would occur, the department uses a map-based screening criterion to identify types and locations of land use projects that would not exceed the same quantitative thresholds of significance described under existing plus project conditions. The analysis uses the 2040 modeling of VMT estimates to present VMT for residential, office, and retail land uses in San Francisco and the region. The department uses that data and associated maps to determine whether a project site's location is below the aforementioned VMT quantitative threshold of significance, including for the other land use types described above.

LOADING

The analysis for addressing loading uses information from a subset of cumulative projects identified in **Table 3.A.1**, p. 3.A.7, including the 2601 Mariposa Street and 1850 Bryant Street projects. The evaluation uses the same methodology as described above under "Loading Methodology" on pp. 3.C.45-3.C.46 for existing plus project conditions.

IMPACT EVALUATION

Existing plus Project Conditions

Impact TR-1: Construction of the proposed project or project variants would not require a substantially extended duration or intense activity and the secondary effects would not create potentially hazardous conditions for people walking, bicycling, or driving; or interfere with accessibility for people walking or bicycling; or substantially delay public transit. (*Less than Significant*)

Proposed Project

The proposed project would be constructed in six overlapping phases over a three- to four-year period. Prior to construction of the proposed project, the existing bus parking, operations, and maintenance support functions would temporarily relocate to the Muni Metro East Light Rail Vehicle Facility (601 25th Street), the 1399 Marin Street Facility, or other SFMTA facilities and bus storage yards. The Presidio, Kirkland, and Woods yards can accommodate the 40-foot-long buses and the Flynn and Islais Creek divisions, and the 1399 Marin Facility can accommodate the 60-foot-long buses. The electric trolley coaches would use the existing overhead contact system (OCS) and/or operate in battery mode to travel between these facilities and the start or end of their routes. All electric trolley coaches at the existing facility have a battery which allows them to travel off-wire for short distances. Therefore, the temporary relocation of the bus and maintenance operations at the existing facility would not require new construction of an OCS for temporary use during proposed project construction. During the three- to four-year construction period of the proposed project, the existing person and vehicle trips to and from the project site and surrounding area as described above starting on p. 3.C.31 under "Existing Site Trips" would not occur at the

project site, but instead would be distributed between two facilities, both located south of the project site in the Bayview neighborhood.

Prior to construction, as part of the permit process, the project sponsor team and its construction contractor(s) would be required to meet with appropriate SFMTA Transportation Engineering personnel to develop and review truck routing plans for demolition, disposal of excavated materials, materials delivery and storage, as well as staging for construction vehicles. The construction contractor(s) would be required to construct the proposed project or project variants in conformance with the City's Regulations for Working in San Francisco Streets, eighth edition (also known as the "SFMTA Blue Book"), public works order 167,840, and public works' **SCM #4, Traffic** (shown in **Table 2.3**, p. 2.50, and in **EIR Appendix C**). These guidelines establish regulations for working in San Francisco streets so that the activities are conducted safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicles. In addition to the regulations in the SFMTA Blue Book and public works' SCMs, the contractor would be responsible for complying with all City, state and federal codes, rules, and regulations.

In general, construction-related activities would typically occur between 7 a.m. and 8 p.m. Nighttime and weekend construction activities may be required. For example, the pouring of concrete for the foundation mat would most likely occur during a continuous 24-hour period and may occur during the overnight hours and/or on a Saturday. Some weekend work, including equipment and material deliveries, would be expected in order to minimize the impact on adjacent traffic, including transit. Construction is not anticipated to occur on major legal holidays but may occur on an as-needed basis. The contractor(s) would be required to comply with the San Francisco Noise Ordinance,[35] which requires a permit for nighttime work.

Construction staging (e.g., staging of construction vehicles, staging of construction materials, construction worker parking, and delivery and haul trucks) would occur onsite and within the sidewalks and parking lanes adjacent to the project site for the duration of project construction. Fifteen on-street parking spaces adjacent to the project site and the bus stop on northbound Bryant Street at the approach to 17th Street would be temporarily removed for the three- to four-year period. The nearest bus stops to the project site for the northbound 27 Bryant route are at the approach to 16th Street and at the approach to Mariposa Street, about 170 feet to the north and south, respectively, of the bus stop that would be temporarily removed. As part of the ongoing construction of the 2601 Mariposa Street project, the bus stop on the east side of Bryant Street at the approach to Mariposa Street has been temporarily removed, pending completion of construction by the end of 2021 (i.e., prior to start of construction of the proposed project or project variants). These three bus stops at the northbound approaches to Mariposa, 17th, and 16th Streets are within one block of each other and are more closely spaced than recommended by the SFMTA's transit

[35] The San Francisco Noise Ordinance allows construction activities seven days a week, between 7:00 a.m. and 8:00 p.m.

stop spacing guidelines.[36] Therefore, the temporary removal of the stop adjacent to the project site for the three- to four-year duration of construction may increase the physical distance and effort required to reach the 27 Bryant route by one block but would not result in substantial overcrowding at the adjacent bus stops, create potentially hazardous conditions or otherwise interfere with accessibility for people walking near the project site.

People walking would be directed to use the sidewalks on the other side of the street from the project site on 17th, Hampshire, Mariposa and Bryant streets. The pedestrian detours and temporary changes to transit stop locations would increase the travel distance for some people walking and taking transit and may be an inconvenience to some people walking. As part of the pedestrian detours, appropriate pedestrian signs, including but not limited to "Sidewalk Closed," would be posted. The number of people walking adjacent to the project site is very low (between 5 and 100 people during the peak hours) and primarily related to the existing transit facility. As noted above, the bus facility maintenance and storage activities would be temporarily relocated to two existing SFMTA facilities and therefore trips associated with this use would not occur adjacent to the project site during the construction period. The SFMTA Blue Book regulations, public works order 167,840, and public works' **SCM #4, Traffic**, require maintaining pedestrian circulation and implementing construction safety measures for people walking.

Potrero Avenue, Bryant Street, and Mariposa Street would be used to access the site, and access into the construction site would be from Mariposa Street. During project construction there would be additional construction trucks on 17th Street, which has a bicycle lane (class II or class IV) in each direction; however, the existing bicycle lanes would be maintained, and therefore construction trucks would not substantially affect bicycle travel. The SFMTA Blue Book and public works' **SCM #4** require maintaining bicycle access and circulation during project construction.

Travel lane closures on 17th and Bryant streets are not anticipated, and therefore would not affect people driving, transit operations for the 27 Bryant bus route, or emergency vehicle access. On Mariposa Street between Bryant and Hampshire streets, the parking lane on the north side of the street and the westbound travel lane would be closed during the first 12 months of construction to provide for additional space for staging, and westbound vehicles would be detoured to 17th and/or 18th streets, which are both two-way streets. Hampshire Street between 17th and Mariposa streets would be partially closed on a temporary, as-needed basis to provide additional space for laydown and staging. When temporary travel lane and partial street closures are required for Mariposa and Hampshire streets, access for people walking, bicycling, and driving would be maintained consistent with the requirements of the SFMTA Blue Book. Construction activities would not require removal or changes to existing on-street commercial or passenger loading spaces on Hampshire, Bryant, or Mariposa streets across the street from the project site, and therefore would

[36] The SFMTA's transit stop spacing guidelines generally recommend transit stops to be 800 to 1,360 feet apart depending on the block lengths and terrain of the neighborhood.

not interfere with existing loading operations using these facilities or create potentially hazardous conditions due to unaccommodated demand.

During the construction period, the number of construction trucks traveling to and from the site would vary depending on the phase and the type of construction activity. **Table 3.C.16: Summary of Construction Phases and Duration and Average Daily Construction Trucks and Workers by Phase** presents the average daily number of construction workers that would be onsite during the day and construction trucks traveling to and from the site during each phase. The peak number of construction trucks would occur during the demolition and site preparation phases, with an average of between 140 and 190 trucks per day. Due to the large size of the project site, it is possible that one or more of these initial phases could overlap, at which point the number of construction trucks per day traveling to and from the site could increase.

Table 3.C.16: Summary of Construction Phases and Duration and Average Daily Construction Trucks and Workers by Phase

Phase [NOTE A]	Duration (months)	Workers Per Day	Daily Construction Trucks [NOTE B]			
			Vendor	Off-Haul	Concrete	Total
Demolition	2	30	20	119	0	139
Site Preparation, Grading and Piling	6	50	5	182	2	189
Foundation and Basement Construction	2	100	25	5	79	109
Building Construction	26	450	25	0	5	30
Paving	2	25	3	1	3	7
Architectural Coating	2	30	5	0	0	5

Notes:
[A] Some of the phases would overlap during the three- to four-year construction duration.
[B] Average daily construction trucks based on the number of work days during each phase.
Source: SFMTA and Public Works Construction Schedule and Equipment List, July 2020. (See **EIR Appendix F-1**.)

As shown on **Table 3.C.16**, the number of daily construction workers would vary by phase depending on the overlap in phases and types of construction activities being performed and would range between about 25 and 450 workers. However, it is anticipated that the addition of the worker-related vehicle- or transit-trips would not substantially affect transportation conditions, as any impacts on the transportation network would be temporary in nature and variable depending on the construction activity. Construction workers who drive to the site could cause a temporary increase in parking demand. The time-limited on-street parking on many streets in the vicinity of the project site would limit legal all-day parking by construction personnel.

Construction activities would be required to be conducted in accordance with public works' **SCM #4, Traffic**; public works order 167,840; and the SFMTA Blue Book to minimize the potential for hazardous conditions and to maintain safe travel in and around the site. Although construction would occur over a period of three to four years, construction would be phased and conducted in compliance with City requirements such that construction work can be done with the least possible interference to people walking, bicycling, or driving or transit operations. Overall,

construction of the proposed project would not create potentially hazardous conditions for people walking, bicycling, driving, or riding transit; interfere with emergency access; or interfere with accessibility for people walking or bicycling; or substantially delay transit. The proposed project's construction-related transportation impacts would be less than significant.

Although the SFMTA would require preparation and implementation of a construction management plan, **Improvement Measure I-TR-A: Construction Management Plan – Additional Measures** identifies additional measures that would be included as a part of the proposed project's construction management plan.

> **Improvement Measure I-TR-A: Construction Management Plan – Additional Measures**
>
> As part of the project's construction management plan, the SFMTA and a private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) will require additional measures to further minimize disruptions to people walking and bicycling, transit, and emergency vehicles during project construction: The additional measures include:
>
> - ***Carpool, Bicycle, Walk, and Transit Access for Construction Workers***—To minimize parking demand and vehicle trips associated with construction workers, the construction contractor will include as part of the Construction Management Plan methods to encourage carpooling, bicycle, walk, and transit access to the project site by construction workers. These methods could include providing secure bicycle parking spaces, participating in free-to-employee and employer ride matching program from *www.511.org*, participating in emergency ride home program through the City of San Francisco (*www.sferh.org*), and providing transit information to construction workers.
> - ***Project Construction Updates for Adjacent Businesses and Residents*—**To minimize construction impacts on access to nearby residences and businesses, the project sponsor team will provide nearby residences and adjacent businesses with regularly updated information regarding project construction, including construction activities, peak construction vehicle activities, travel lane closures, and parking lane and sidewalk closures (e.g., via the project's website). At regular intervals to be defined in the construction management plan, a regular email notice will be distributed by the project sponsor team that will provide current construction information of interest to neighbors, as well as contact information for specific construction inquiries or concerns.

Project Variants

Construction activities for the Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, the Active 17th Street Variant, and the Employee and Family Support Variant would be the same as described above for the proposed project, and therefore construction of these variants would not create potentially hazardous conditions for people walking, bicycling, driving, or riding transit; interfere with emergency access; or interfere with accessibility for people walking

or bicycling; or substantially delay transit. Therefore, similar to the proposed project, construction-related transportation impacts of the project variants would be less than significant.

Impact TR-2: Operation of the proposed project or project variants would not create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations. (*Less than Significant*)

The project proposes a number of changes to the street network adjacent to the project site, including changes to driveway locations, reconstructed sidewalks, a raised crosswalk, sidewalk bulbouts, upgrade of the bicycle lanes on 17th Street, and various color curb changes on Bryant, Mariposa, and Hampshire streets. See **Figure 2.3: Proposed Site Plan** in **EIR Chapter 2, Project Description**, p. 2.20, for an illustration of proposed changes. The design of the driveways and street network changes, including the raised crosswalk, would be consistent with Better Streets Plan guidelines. The street network changes would be required to undergo review by SFMTA's Transportation Advisory Committee and the San Francisco Fire Department (fire department), along with other City agencies. The proposed project would not include any design features that would create potentially hazardous conditions.

The proposed project would add trips by people walking, bicycling, and driving. During the weekday p.m. peak hour, the proposed project would generate about 537 walk trips (388 walk-only and 149 walk-to-transit trips) and 28 bicycle trips. In addition, during the p.m. peak hour the project would generate 226 net-new vehicle trips (49 by the transit facility and 177 by the joint development uses). The net-new trips represent the new vehicle trips that would be added to the roadway network after accounting for the existing bus and maintenance activity at the site.

WALKING AND BICYCLING

Peak activity for the transit facility and the residential and retail uses would not overlap. However, people walking and bicycling would be exposed to a greater number of driveways, buses, maintenance vehicles, and delivery trucks than on other residential blocks in the neighborhood.

The street network changes would enhance the environment and safety for people walking adjacent to the project site and people bicycling along 17th Street. The walking network adjacent to the project site would be enhanced by the proposed sidewalk widening on Mariposa Street; sidewalk bulbouts adjacent to the project site onto Bryant and Mariposa streets at the intersection of Bryant Street/Mariposa Street and onto Hampshire Street at the intersection of Hampshire Street/Mariposa Street; new curb ramps; and new continental crosswalks. In addition, the raised crosswalk across 17th Street at Hampshire Street and the rectangular rapid flashing beacon would prioritize safe movement of people walking between the project site and locations north of the site such as Franklin Square and the Potrero Center commercial area.

Pedestrian access to the proposed project's ground-floor retail uses would be on Bryant Street, while access to the residential units would be located on Bryant and Mariposa streets, and therefore the majority of the new trips by walking and bicycling would be on Bryant and Mariposa streets, including within the crosswalks at the adjacent intersections of Bryant Street/17th Street and Bryant Street/Mariposa Street. Pedestrian access to the transit facility would be on Mariposa Street.

On Bryant Street the project would convert approximately six general vehicle parking spaces to commercial and passenger loading zones, which would increase the number of vehicles accessing the curbside compared to existing conditions. During the p.m. peak hour there would be about 52 passenger loading/unloading instances generated by the proposed project. Curbside passenger loading activities adjacent to the project site would be similar to conditions at other nearby loading zones and do not represent potentially hazardous conditions for people walking or bicycling.

On Mariposa Street there would be a lobby for the residential units located midway between York and Hampshire streets, and also an access point near Bryant Street for the residential lobby fronting Bryant Street. The residential lobby located midway between York and Hampshire streets would be located between multiple curb cuts/driveways for the proposed project's transit facility, and therefore people walking to and from this lobby would cross one or more transit facility driveways. These driveways would have an audible and/or visual warning system for people walking as buses exit onto Mariposa Street. These vehicle turning movements into and out of the transit facility are not expected to create potentially hazardous conditions for people walking on Mariposa Street as drivers exiting the transit facility would have unobstructed sightlines and/or adequate sight distance to see approaching people walking or bicycling, the travel speeds of vehicles turning into and out of the site would be lower than the adjacent street traffic, and drivers would need to wait for a gap in people walking on the sidewalk to complete their turn. During the p.m. peak hour, when pedestrian volumes are highest, buses are expected to exit via these driveways approximately once every 10 minutes, with other vehicles using driveways once every minute.

The transit facility would be most active during the early morning hours, as buses leave the facility to access their routes (generally between 4 a.m. and 7 a.m.), and during the late evening hours, as buses arrive at the facility after service terminates (generally between 7 p.m. and 9 p.m.). Vehicle trips into and out of the transit facility throughout the rest of the day would be substantially lower than during those hours, and would be associated with the administrative, training, and maintenance activities at the transit facility. The curb cut/driveway into the onsite basement-level loading area would be limited to freight loading for both the transit facility and the joint development components (about 14 delivery and service vehicle trips per day), trash/compost/recycling removal for the transit facility and the residential units, and 12 car-share parking spaces; most activity would occur during the early morning or midday hours, outside of the peak periods for the transit facility.

The proposed project would enhance bicycling conditions on 17th Street and would not include any physical features that would obstruct the bicycle lanes on 17th Street. The conversion of the existing striped and partially protected bicycle lanes into wider green protected bikeways in both directions on the segment of 17th Street between Bryant and Hampshire streets would improve bicycle safety by providing greater separation of right-of-way compared to existing conditions. As noted in **EIR Chapter 2, Project Description**, p. 2.45, if the widened bikeways are determined not to be feasible, the SFMTA would raise the bike lane on the south side to sidewalk level, apply green paint, and install "safe hit posts." With both types of separated bike lane scenarios, the existing driveway on 17th Street west of Hampshire Street would be reconfigured and the width reduced from 52 to 42 feet, and would include visual and/or audible warning systems. Under the proposed project this driveway would serve as an emergency exit for the transit facility, and therefore the number of vehicles crossing the eastbound bike lane would decrease compared to existing conditions, as the emergency exit would be rarely used. While these alternative improvements for bicycle travel along 17th Street would not be as effective in enhancing bicycle safety as the green protected widened bikeways, bicycle safety for eastbound travel would be improved compared to existing conditions. The project would add vehicles to 17th Street (e.g., 21 vehicles during the p.m. peak hour); however, because no on-street loading zones or project driveways would be located on 17th Street (except for the emergency exit described above), the additional vehicles on 17th Street are not expected to create potentially hazardous conditions for bicyclists.

The proposed project would convert the existing 90-degree angle parking spaces on the east side of Hampshire Street between 17th and Mariposa streets to parallel parking spaces. This reconfiguration would widen the existing travel lanes and would provide additional room for bicyclists and vehicles. As noted above on p. 3.C.13 under "Environmental Setting," Hampshire Street is used by bicyclists to travel north to eastbound 17th Street during the a.m. peak hour, and from westbound 17th Street to southbound Hampshire Street during the p.m. peak hour; the total number of bicyclists using the roadway is considered low, at 35 to 40 cyclists during the peak hours. In addition, no potentially vulnerable areas were identified near the project site under existing conditions that could create potential hazards for people bicycling or walking.

In summary, because of the wider sidewalks and enhanced bicycling conditions, conformance with City design standards, and an audible and/or visual warning system at the driveways, the transit facility operations would not create potentially hazardous conditions for people walking or bicycling.

DRIVING AND PUBLIC TRANSIT OPERATIONS

The proposed project's street network would accommodate various vehicle types, including trucks and buses, and the proposed conceptual plans have undergone conceptual review by City agencies. Final design would be subject to approval by the SFMTA, public works, and the fire department so

that the streets are designed consistent with City policies and design standards, including the Better Streets Plan, and do not result in potentially hazardous conditions for people driving or public transit operators. The project would generate additional vehicles (i.e., 226 net-new vehicles during the p.m. peak hour); however, increases in vehicles using the roadway are not considered driving hazards. During the p.m. peak hour there would be 130 net-new inbound and 96 outbound vehicle trips traveling to and from the project area. Because vehicle parking would not be provided onsite (with the exception of 12 car-share parking spaces), the majority of these vehicles would either be destined to and from the on-street passenger loading zone on Bryant Street (e.g., taxi/TNC vehicles) and on-street parking in the neighborhood.

With the reconfiguration of transit facility driveways and access points, on-street parking would be removed on the north side of Mariposa Street between Bryant and Hampshire streets to facilitate bus movements into and out of the transit facility. This reconfigured access would also not create potentially hazardous conditions for people driving on Mariposa Street; the removal of parking is intended to facilitate clear sightlines for both vehicles on Mariposa Street and vehicles using the driveways. The driveways would be designed to the standards for transit facilities to allow for adequate space and visibility for vehicles exiting the project site and accessing the adjacent travel lanes.

The proposed raised crosswalk and rapid flashing beacon on 17th Street would not be anticipated to create potentially hazardous conditions for people driving, as it would be designed to engineering standards and the raised crosswalk would include a rectangular rapid flashing beacon to notify drivers of the pedestrian crossing. During the p.m. peak hour there are currently 638 vehicles traveling on 17th Street between Bryant and Hampshire streets (364 westbound and 274 eastbound) and the proposed project would add 21 vehicles to this segment. These additional project-generated vehicles combined with the raised crosswalk and upgraded bicycle lanes described above would not create potentially hazardous conditions for people driving. There are no local or regional bus routes traveling on this segment of 17th Street that would be affected by the proposed street network changes.

Therefore, for the reasons described above, the proposed project would not create potentially hazardous conditions for people driving or transit operations.

Overall, the proposed project would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations, and the proposed project's impacts related to potentially hazardous conditions would be less than significant.

Project Variants

The proposed land uses and street network changes for the Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, and the Active 17th Street Variant would be the

same as for the proposed project, and these variants would not change the travel demand. The site access for people walking, bicycling, or driving, and transit operations for the Active 17th Street Variant would be the same as for the proposed project. The Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, and the Employee and Family Support Variant[37] would have somewhat different configurations of the project features and street network changes, as follows:

- Under the Emergency Exit Relocation Variant, the emergency exit for the transit facility would be relocated from 17th Street to Hampshire Street, and five on-street parking spaces would be removed on the west side of the street to accommodate the emergency exit driveway. The relocation of the emergency exit would remove the proposed 42-foot-wide driveway on 17th Street, and would therefore remove a location of potential conflicts between bicyclists traveling eastbound within the bicycle lane and buses exiting the facility and crossing the eastbound bicycle lane (no conflicts between bicyclists and transit facility vehicles were observed during field surveys of existing transit facility operations). While there is bicycle activity on Hampshire Street where the new emergency exit would be located, the number of bicyclists traveling on Hampshire Street is substantially lower than the number within the 17th Street bicycle lanes.

  Across the street from the proposed location of the emergency exit for the transit facility on Hampshire Street, two on-street parking spaces would be removed. With the reconfiguration of on-street parking on the east side of Hampshire Street between 17th and Mariposa streets from 90-degree angle to parallel and the removal of the two on-street parking spaces on the east side of Hampshire Street, buses and other vehicles would have adequate right-of-way to be able to exit the transit facility and turn right or left onto Hampshire Street. Hampshire Street has lower vehicle volumes than 17th Street and no transit service, and use of the emergency exit would be rare. Therefore, the potential for conflicts between vehicles exiting the transit facility and vehicles on the street would be low. Therefore, the relocation of the emergency exit to Hampshire Street would not create potentially hazardous conditions for people walking, bicycling, or driving on Hampshire Street.

- The Joint Development Lobby Relocation Variant would relocate the residential lobby located on Mariposa Street midway between York and Hampshire streets to Hampshire Street north of Mariposa Street, which would reduce the potential for conflicts between people walking and transit facility operations on Mariposa Street. With the relocated residential lobby, some pedestrians would use 17th and Hampshire streets, or the south side of Mariposa Street, to walk to and from the site and would therefore not need to cross multiple transit facility driveways on Mariposa Street. However, because Bryant and Mariposa streets have less of a grade change (about 1 percent for Mariposa Street and 3.5 percent for Bryant Street) than 17th Street and Hampshire streets (about 3 percent for 17th Street and 5.5 percent for Hampshire Street), a portion of the residents would use Mariposa Street adjacent to the project site to access the residential lobby on Hampshire Street and cross the transit facility driveways (i.e., people walking generally tend to use

[37] The Employee and Family Support Variant is a land use variant that would include particularly vulnerable people (i.e., children). Consistent with the 2019 SF Guidelines, the impact analyses of this variant with respect to potentially hazardous conditions (Impact TR-2) and accessibility (Impact TR-3 below) considered the presence of people and children walking to and from and adjacent to the project site.

streets with less of a grade to access their destination). However, as noted above, the transit facility would include audible and/or visual warning systems at the Mariposa Street exit driveways and the peak activity of the transit facility would not overlap with the peak hours of travel for residents.

- Under the Employee and Family Support Variant, 9,000 gross square feet of the proposed project's commercial retail space would be converted to childcare uses, and nine general on-street parking spaces on Bryant Street would be converted to childcare passenger loading. The childcare use would further increase the number of vehicles accessing the curbside compared to the proposed project (i.e., a total of 81 passenger loading/unloading instances under this variant during the p.m. peak hour compared to 52 passenger loading/unloading instances under the proposed project). However, the additional passenger loading activities would be accommodated within the childcare loading spaces, thereby not blocking a travel lane, and would not represent potentially hazardous conditions for people walking, bicycling, or driving or transit operations on Bryant Street. Prior to project variant approval, the department would require the joint development sponsor to prepare a Childcare Drop-off and Pick-up Management Plan[38] that would address the specific loading activities and needs associated with the childcare uses (also see **Impact TR-6** for an assessment of passenger loading activities, pp. 3.C.64-3.C.68).

Therefore, similar to the proposed project, the project variants' impacts related to potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations would be less than significant.

Impact TR-3: Operation of the proposed project or project variants would not interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access. (*Less than Significant*)

Proposed Project

The proposed project would not involve any substantial changes to the street network that would interfere with walking or bicycling to and from the project site and adjoining areas, or result in inadequate emergency access. As listed above in **Impact TR-2**, proposed street network changes include removal of on-street parking, color curb changes, sidewalk bulbouts, curb ramps, continental crosswalks, sidewalk widening, and upgrades to the existing bicycle lanes on 17th Street. In addition, the proposed project would also implement a raised crosswalk across 17th Street at Hampshire Street with a rectangular flashing beacon. The project would be designed to be compliant with the Americans with Disabilities Act.

WALKING AND BICYCLING

The walking network adjacent to the project site would be enhanced by the proposed sidewalk widening on Mariposa Street; sidewalk bulbouts onto Bryant and onto Mariposa streets at the

[38] The department requires such a plan for any project with a new or expanded school or childcare facility. Refer to here: *https://sfplanning.org/resource/school-and-child-care-drop-and-pick-management-supplemental*.

intersection of Bryant Street/Mariposa Street and onto Hampshire Street at the intersection of Hampshire Street/Mariposa Street; new curb ramps; and continental crosswalks. In addition, the raised crosswalk across 17th Street at Hampshire Street and rapid flashing beacon would prioritize safe movement of people walking between the project site and locations north of the site such as Franklin Square and the Potrero Center commercial area.

During the weekday p.m. peak hour, the proposed project would add about 537 walk trips (388 walk-only and 149 walk-to-transit trips) to the adjacent sidewalks on Bryant and Mariposa streets, with about 211 trips destined to and from the retail uses on Bryant Street, 280 trips to and from the residential lobbies/access points on Mariposa and Bryant streets, and 46 trips to and from the transit facility access points on Mariposa Street. People accessing transit would primarily walk on Bryant Street to access the 27 Bryant bus stop adjacent to the project site at 17th Street, or continue north along Bryant Street to 16th Street to access the 22 Fillmore, 33 Ashbury/18th Street, and 55 16th Street routes on 16th Street, or walk east on Mariposa Street to access the 9 San Bruno, 9R San Bruno Rapid, or 33 Ashbury/16th Street routes. People would also walk west along 17th or 16th streets to access other Muni routes on Folsom and Mission streets and the 16th Street BART station on Mission Street. As noted under "Existing Conditions," p. 3.C.10, the numbers of people walking on sidewalks adjacent to the project site (fewer than 100 people per hour during the peak hours) and within crosswalks at nearby intersections are generally low (fewer than 250 people combined crossing within the crosswalks at nearby intersections), and the additional project trips would not create overcrowding or otherwise interfere with accessibility for people walking in the area.

The existing striped and partially protected bicycle lanes on 17th Street would be converted into green protected widened bikeways in both directions on the segment of 17th Street between Bryant and Hampshire streets, and on-street parking on the north side of the street would be removed. As noted in **EIR Chapter 2, Project Description**, p. 2.45, if the widened bikeways are determined not to be feasible, the SFMTA would raise the bike lane on the south side to sidewalk level, apply green paint, and install "safe hit posts." These bicycle lane upgrades would enhance the bicycle network on 17th Street and enhance accessibility, compared to existing conditions, and would not include any physical features that would obstruct the bicycle lanes on 17th Street or other bicycle lanes in the study area. During the p.m. peak hour, the project would generate 28 trips by bicycling, which would not result in overcrowding on bicycle facilities on 17th Street or in the project vicinity.

The proposed project would include 736 class 1 bicycle parking spaces located within the below-grade basement level and would be accessible via transit facility and joint development elevators for use by unit residents, non-residential occupants, and employees.

Overall, the proposed project would promote accessibility for people walking and bicycling to the site by reconstructing and widening adjacent sidewalks, and upgrading the bicycle lane on

17th Street. The project would not generate activities that would interfere with access or circulation for people walking or bicycling.

EMERGENCY ACCESS

The proposed project would not introduce any design features or street network changes that would substantially change emergency vehicle travel adjacent to the project site. Emergency access routes to the project site would remain unchanged compared with existing conditions. The width of the vehicle travel right-of-way on both Hampshire and Mariposa streets adjacent to the project site would be widened through the proposed reconfiguration of on-street parking on the east side of Hampshire Street (i.e., from 90-degree angle to parallel parking) and the proposed removal of on-street parking on the north side of Mariposa Street. The widened vehicle travel rights-of-way would facilitate maneuverability for emergency vehicles. Therefore, the proposed project would not result in inadequate emergency access.

Therefore, for the reasons described above, the proposed project would not interfere with accessibility of people walking or bicycling, or result in inadequate emergency access, and the proposed project's impacts related to accessibility would be less than significant.

Project Variants

The proposed land uses and street network changes for the Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, the Active 17th Street Variant, and the Employee and Family Support Variant would be the same or similar to the proposed project, and the impact assessment would be the same as described above for the proposed project. Similar to the proposed project, the project variants' impacts related to accessibility would be less than significant.

Impact TR-4: Operation of the proposed project or project variants would not substantially delay public transit. (*Less than Significant*)

The proposed project would not result in permanent relocation or removal of any existing bus stops, and therefore would not change existing bus operations. The transit facility component of the proposed project would accommodate the modernization and expansion of the trolley bus maintenance, fleet size, operation, and administrative services, and would make transit operations more efficient. The project would also accommodate the expansion and consolidation of training operations, currently sited elsewhere, in one location. The new facility would accommodate up to 213 trolley buses, an increase of 55 buses from the 158 buses currently accommodated under constrained conditions, but would not alter transit service. The proposed project travel demand and impact analysis assumes an increase of 55 additional buses over existing conditions traveling to and from the project site on a daily basis. However, it is noted that these additional buses would be a result of expansion of transit service on the bus routes accommodated at the facility, rather than a result of the additional bus storage capacity of the new facility. The increases in service on the

routes accommodated at this facility, as described and analyzed in the Transit Effectiveness Project and consistent with the 10 percent growth in the Muni Fleet Plan, was evaluated in previous environmental documentation and associated project approvals.[39]

During the weekday p.m. peak hour, the proposed project would generate a net-new increase of 130 inbound and 96 outbound vehicle trips. The 226 net-new p.m. peak hour vehicle trips would be as follows:

- 33 net-new transit facility trips (7 inbound and 26 outbound)
- 38 new taxi/TNC trips (19 inbound and 19 outbound)
- 155 new residential and retail non-taxi/TNC vehicle trips (104 inbound and 51 outbound)

The 226 net-new p.m. peak hour project vehicle trips would be less than the 300 p.m. peak-hour project vehicle trips identified by the department as the number of vehicle trips that could result in delays for transit and exceed the four-minute threshold of significance. Therefore, the proposed project would not result in a significant impact related to transit delay.

For informational purposes, all access/egress driveways serving the transit facility and joint development would be on Mariposa Street, except for the emergency exit driveway onto 17th Street. The project was designed to accommodate the bus turns into and out of the transit facility, and between Mariposa Street and other streets. For example, the bulbouts into Mariposa and Bryant streets at the intersection of Bryant Street/Mariposa Street would be smaller than standard corner bulbouts to provide adequate maneuvering space for buses turning from westbound Mariposa Street onto northbound Bryant Street. Under existing conditions, this location is striped off and safe hit posts are positioned within the striped area. As part of final design of the street network changes, field testing of the bus movements would be conducted to verify that the dimensions of the bulbouts would not impede bus movements.

On Mariposa Street, the driveway into the onsite basement-level loading area would be limited to freight loading for both the transit facility and the joint development components, trash/compost/recycling removal for the transit facility and the residential units, and 12 car-share parking spaces. These activities would not likely overlap with the peak of the transit facility (i.e., between 4 a.m. and 7 a.m., and between 7 p.m. and 9 p.m.). Thus, buses would enter and exit the transit facility similar to existing conditions, and the joint development activities within the basement level would not substantially affect transit operations or create new conflicts with transit vehicles. The proposed project would not provide any driveways on Bryant Street on which the 27 Bryant bus route travels.

[39] City and County of San Francisco, Transit Effectiveness Project, Final EIR, March 2014. Planning Department Case File No. 2011.0555E.

The proposed project would not provide onsite vehicular parking for the residential or retail uses. However, 12 car-share parking spaces would be provided within the basement level. Therefore, the majority of the new residential and retail non-taxi/TNC vehicle trips generated by the proposed project (e.g., the 104 inbound and 51 outbound during the weekday p.m. peak hour) would not travel to the project site but instead would seek nearby parking on-street and in off-street facilities.

No Muni or regional transit routes operate on 17th or Hampshire streets, and there are no driveways proposed on either street, with the exception of the transit facility emergency exit on 17th Street. This exit would only be used during emergencies, and therefore would be used rarely.

Project Variants

The proposed land uses and street network changes for the Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, and the Active 17th Street Variant would be the same as for the proposed project, and these variants would not affect how vehicles would access the transit facility or change on-street conditions for transit operations. For these project variants the number of vehicles generated by the proposed land uses would be the same as for the proposed project, and therefore the transit impact assessment for these project variants would remain the same as those identified above for the proposed project.

The Employee and Family Support Variant would replace 9,000 of the 33,000 square feet of commercial retail uses included in the proposed project with childcare uses. With the change in land uses, the Employee and Family Support Variant would generate 278 net-new vehicle trips during the p.m. peak hour, which, similar to the proposed project, would be less than the 300 p.m. peak-hour project vehicle trips identified by the department as the number of vehicle trips that could result in delays for transit and exceed the four-minute threshold of significance. Therefore, the transit impact assessment for the Employee and Family Support Variant would remain the same as identified above for the proposed project.

Under all project variants, the nearby transit service and transit facility operations would remain similar to that described for the proposed project.

Therefore, similar to the proposed project, transit impacts under the project variants would be less than significant.

Impact TR-5: Operation of the proposed project or project variants would not cause substantial additional VMT or substantially induce automobile travel. (*Less than Significant*)

As presented in **Table 3.C.6**, p. 3.C.19, the existing average daily VMT per capita for the transportation analysis zone in which the proposed project site is located (i.e., TAZ 538) is below the existing regional average daily VMT. Specifically:

- For the residential uses, the average daily VMT per capita is 5.3, which is about 69 percent below the existing regional average daily VMT per capita of 17.2.
- For the office uses (i.e., transit facility administrative and training uses, childcare)[40], the average daily work-related VMT per employee is 9.6, which is about 50 percent below the existing regional average daily work-related VMT per employee of 19.1.
- For the retail uses, the average daily retail VMT per employee is 9.8, which is about 34 percent below the existing regional average daily retail VMT per employee of 14.9.[41],[42]

As described above under "VMT Analysis Methodology," the project site is within an area of the city where the existing VMT is more than 15 percent below the regional VMT thresholds. The proposed project would meet the City's map-based screening for residential, office (transit facility), and retail projects, and it would include similar features to other developments in the area in terms of density and mix of uses. As such, the proposed project's land uses would not generate a substantial increase in VMT. Furthermore, the project site meets the proximity to transit stations screening criterion, which also indicates that the proposed project's uses would not cause substantial additional VMT.

The proposed project is also a transportation project and includes features that would alter the transportation network adjacent to the project site. Therefore, as described above under "VMT Analysis Methodology," the VMT impact assessment entailed a review of the proposed project features that would alter the transportation network to determine whether they would induce automobile travel. The features that would alter the transportation network include reconstructed and widened sidewalks, bicycle lane upgrades, reconfigured on-street vehicular parking, closures and/or relocation of driveways, and on-street commercial and passenger loading zones. These features fit within the general types of projects that would not substantially induce automobile travel. In addition, the transit facility component of the proposed project is a replacement project designed to improve conditions for an existing transportation asset, and therefore the transit facility component would be considered a type of project that would not induce automobile travel.

[40] OPR has not provided a proposed screening criteria and thresholds of significance for 'other' types of land use, beyond residential, retail, office. The Planning Department has designated the project's 'other' land uses (i.e., transit facility administrative and training uses, childcare) to be treated as office for screening and analysis.

[41] Retail travel is not explicitly captured in San Francisco chained activity modeling process; rather, there is a generic "Other" purpose which includes retail shopping, medical appointments, visiting friends or family, and all other non-work, non-school tours. The retail efficiency metric captures all of the "Other" purpose travel generated by Bay Area households. The denominator of employment (including retail; cultural, institutional, and educational; and medical employment; school enrollment, and number of households) represents the size, or attraction, of the zone for this type of "Other" purpose travel.

[42] San Francisco Planning Department. Eligibility Checklist: CEQA Section 21099 – Modernization of Transportation Analysis for 2500 Mariposa St – SFMTA Potrero Yard Modernization Project, April 9, 2021.

Both the transit facility and joint development components of the proposed project would be subject to the City's TDM program requirements.

Therefore, for the reasons described above, the proposed project impacts related to VMT and induced automobile travel would be less than significant.

Project Variants

Under the Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, the Active 17th Street Variant, and the Employee and Family Support Variant, the project land uses and transportation features would remain the same as or similar to the proposed project, and the impact assessment would be the same as discussed above for the proposed project. Similar to the proposed project, impacts of the project variants related to VMT and induced automobile travel would be less than significant.

Impact TR-6: Operation of the proposed project or project variants would not result in a loading deficit. (*Less than Significant*)

Proposed Project

FREIGHT LOADING

The proposed project includes two onsite commercial loading spaces within the below-grade garage to serve the transit facility and the joint development land uses. In addition, the project proposes a 40-foot-long commercial loading zone (which could accommodate up to two vehicles) on Bryant Street adjacent to the project site and proposed retail uses on Bryant Street. The locations of the on-street loading zones are presented on **Figure 2.3: Project Site Plan**, p. 2.20.

Review of available conceptual plans for the garage access ramp and basement-level driveway aisles and loading areas indicate that larger SU30[43] trucks would be able to access and maneuver into and out of the loading spaces. Final design review by the SFMTA would reassess if larger trucks or vehicles with larger turning radii would also need to be accommodated, and the basement would be designed accordingly to reflect these larger vehicles. The on-street commercial and passenger loading spaces would be designed consistent with existing SFMTA and public works standards, as well as the Better Streets Plan requirements, to provide for efficient access into the zones (e.g., length and width of loading space). Time-of-day loading restrictions would be used to promote more efficient use of limited curb space and avoid conflicts between loading and other activities.

[43] SU30 (single unit) trucks include standard delivery trucks 30 feet in length that are common in downtown and commercial areas.

The proposed project's peak hour commercial loading demand of three loading spaces (one for the transit facility, and two for the joint development residential and retail uses) would be accommodated with the two onsite and two on-street loading spaces. No commercial loading deficit would occur.

For the transit facility and the residential units, a dedicated trash/recycling/compost room would be provided within the basement level and would be accessed via the ramp to and from Mariposa Street. Trash pickup for these uses would occur underground, and both the ramp and basement level would have adequate clearance for garbage truck access to the basement level, to maneuver within the basement level, and to conduct trash pickup, which is anticipated to be via a roll-off compactor. The proposed 20-foot vertical clearance within the basement and on the access ramp would accommodate the trash/recycling/compost collection vehicles and pickup operations. For the ground-floor retail uses, the individual retail tenants would transport the trash, recycling, and compost bins to the Bryant Street curb for pickup. Trash/recycle/compost collection occurs during the early morning hours and could potentially overlap with the peak period for buses leaving the transit facility and traveling northbound on Bryant Street to access their routes. However, given the limited amount of ground-floor retail uses, the short duration of collection activities, and the ability of a bus to maneuver around a collection vehicle stopped in the travel lane, the trash/recycle/compost collection for the ground-floor retail uses is not expected to create potentially hazardous conditions or delay transit.

The single loading space within the basement for the residential uses would also accommodate residential move-in and move-out activities. This loading space would be located near the freight elevators for the joint development uses. The 20-foot vertical clearance on the access ramp and in the basement would accommodate moving trucks, including larger moving trucks (e.g., a 23-foot-long moving truck can fit items from a three- to four-bedroom house), and therefore move-in and move-out activities are not anticipated to occur on-street at the curb adjacent to the project site. Should on-street parking be necessary for move-in/move-out activities (e.g., cross country moves conducted in semi-trailer trucks 68 feet in length), individuals or residential building management would be required to reserve spaces on Bryant Street through SFMTA's temporary signage program. Typically, these activities occur during off-peak times, such as on weekends when there are lower volumes of vehicles, people walking, and bicycling. Therefore, residential move-in/move-out operations would not substantially affect transportation conditions in the project vicinity.

PASSENGER LOADING

The proposed project would include a 60-foot-long passenger loading zone (which could accommodate up to three vehicles) on Bryant Street and a 60-foot parallel passenger loading bulbout on Hampshire Street (which could accommodate up to three vehicles) adjacent to the project site (see **Figure 2.3: Project Site Plan**, p. 2.20). The passenger loading zone on Bryant

Street would be adjacent to the ground-floor retail uses and the residential access point on Bryant Street, within 60 feet of the residential access on Mariposa Street just east of Bryant Street, and within 420 feet of the residential access on Mariposa Street midway between York and Hampshire streets. The passenger loading bulbout on Hampshire Street would be within 90 feet of the residential access on Mariposa Street midway between York and Hampshire streets. During the weekday p.m. peak hour, the proposed project would generate 52 passenger loading instances (14 for the transit facility uses and 38 for the residential and retail uses), which corresponds to a demand for two passenger loading spaces at the project site. This passenger loading demand would be accommodated within the two 60-foot-long passenger loading zones that, combined, would accommodate up to six vehicles. Thus, the passenger loading activities would not result in double parking or substantially delay transit operations on Bryant Street (i.e., the 27 Bryant bus route that runs northbound adjacent to the project site and any buses exiting the transit facility during the p.m. peak hour).

The proposed onsite and on-street loading facilities for the proposed project would be adequate to accommodate the projected demand. Therefore, no secondary impact analysis is required. The impacts of the proposed project related to loading would be less than significant.

Although the proposed project would not result in a loading deficit, **Improvement Measure I-TR-B: Driveway and Loading Operations Plan** is identified to help manage onsite and on-street loading operations of the transit facility and the joint development uses, and minimize conflicts between onsite and on-street loading operations/transit facility activities and people walking, bicycling, and driving on the adjacent streets.

> **Improvement Measure I-TR-B: Driveway and Loading Operations Plan (DLOP)**
>
> The project sponsor team will be required to prepare and implement a Driveway and Loading Operations Plan (DLOP). The DLOP will be prepared by the private project co-sponsor, in coordination with the SFMTA, and submitted as part of the application for the first temporary occupancy permit. The DLOP will include provisions to manage loading activities and driveway operations associated with the below-grade onsite loading spaces; provisions for assessing on-street commercial and passenger loading supply and protocol for expanding on-street supply, if needed; provisions for trash/recycling/compost truck access and collection operations; provisions for residential move-in and move-out operations; provisions for scheduling Muni deliveries using the onsite loading facilities; and provisions for accommodating recurring deliveries such as from private company vans and trucks, and the United States Postal Service vehicles within the onsite loading facilities.
>
> The intent of the DLOP is to reduce potential conflicts between passenger and freight loading and transit operations, and between passenger and freight loading activities and people walking and bicycling, and other vehicles in the project vicinity, as well as to maximize reliance on onsite facilities to accommodate freight loading demand.

Project Variants

The proposed land uses and commercial and passenger loading demand for the Emergency Exit Relocation Variant, the Joint Development Lobby Relocation Variant, and the Active 17th Street Variant would be the same as for the proposed project. The Employee and Family Support Variant would have a greater passenger loading demand than the proposed project. The proposed commercial and passenger loading supply and demand for the variants compared to the proposed project are as follows:

- Under the Emergency Exit Relocation Variant, the commercial and passenger loading supply and demand conditions would be the same as for the proposed project.
- Under the Joint Development Lobby Relocation Variant, the relocation of the residential lobby from Mariposa Street midway between York and Hampshire streets to Hampshire Street north of Mariposa Street would not change the proposed commercial and passenger loading space supply from the proposed project. Similar to the proposed project, the Joint Development Lobby Relocation Variant would include the proposed 60-foot parallel passenger loading bulbout on the west side of Hampshire Street at the approach to Mariposa Street, which would be nearby the relocated lobby. With the relocation of the residential lobby to Hampshire Street, the commercial loading zone on Bryant Street would be more than 480 feet away from the relocated residential lobby. However, on the east side of Hampshire Street, the existing commercial loading spaces that would be included as part of the reconfiguration of the on-street parking from 90-degree angle to parallel parking would be available for commercial loading activities and would be closer than the proposed spaces on Bryant Street.
- Under the Active 17th Street Variant, the internal ramp circulation changes would allow for ground-floor retail uses along 17th Street. Under this variant, the 60-foot-long commercial loading zone on Bryant Street north of Mariposa Street would be provided and additional on-street commercial loading spaces would be provided on the northern portion of Bryant Street south of 17th Street and/or on Hampshire Street by converting general parking spaces to commercial loading zones. For the ground-floor retail uses, the individual retail tenants would transport the trash, recycling, and compost bins to the 17th Street curb for pickup. Because trash/recycling/compost pickup occurs during the early morning hours, carting of trash containers between the curb and garbage truck would not substantially affect bicycle travel within the eastbound bicycle lane.
- Under the Employee and Family Support Variant 9,000 gross square feet of the 33,000 gross square feet of commercial retail uses included in the proposed project would be replaced with childcare uses. This variant would generate the same freight loading demand as the proposed project (i.e., a demand for three spaces during the peak hour of loading activities); however, it would generate an increase in passenger loading demand due to childcare uses (81 loading instances during the p.m. peak hour under this variant, compared to 52 loading instances under the proposed project).

  The 81 passenger loading instances generated by the Employee and Family Support Variant during the p.m. peak hour correspond to a demand for eight passenger loading spaces at the project site. This peak demand would be accommodated within the two 60-foot-long passenger loading zones on Bryant and Hampshire streets (six vehicles) and the childcare passenger loading zone on Bryant Street (nine spaces). During the p.m. peak

hour, the passenger loading demand for the childcare uses would be six spaces, and this demand would be contained within the nine passenger loading spaces designated for the childcare uses. Prior to project variant approval, the department would require the joint development sponsor to prepare a Childcare Drop-off and Pick-up Management Plan that would address the specific loading activities and needs associated with the childcare uses. Thus, similar to the proposed project, the Employee and Family Support Variant would not result in a loading deficit.

Thus, similar to the proposed project, loading impacts under the project variants would be less than significant.

2040 Cumulative Conditions

The geographic context for the analysis of cumulative impacts is the transportation study area presented on **Figure 3.C.1**, p. 3.C.2. This section discusses the cumulative impacts to transportation that could result from the proposed project or project variants in combination with cumulative projects. Additional discussion of the land use development and transportation network assumptions is provided in "2040 Cumulative Conditions" on p. 3.C.45.

Impact C-TR-1: The proposed project or project variants, in combination with cumulative projects, would not result in significant construction-related transportation impacts. (*Less than Significant*)

Construction of the proposed project or project variants could overlap with construction of a number of other projects. **Figure 3.A.1: Cumulative Projects**, p. 3.A.9, presents the cumulative projects considered in the analysis. Of the 11 development projects that have been entitled, are currently under review, or are under construction, the construction schedules of nine development projects may overlap; however, the timing of construction is not known, and most are not located in the immediate vicinity of the project site. Construction of the 2601 Mariposa Street project (KQED renovation/expansion) is currently underway, and construction will be completed prior to initiation of construction of the proposed project. In addition, construction of the SFMTA 16th Street Improvement Project will be completed in the spring of 2022, prior to initiation of construction of the proposed project. Therefore, construction of only the 1850 Bryant Street project, located across the street from the project site, could have an overlapping schedule during 18 months of the 1850 Bryant Street project's construction duration. During this overlapping period the same roadways could be used to access the project site (e.g., Bryant Street, 17th Street). Construction of the proposed project and the 1850 Bryant Street project would not likely change circulation patterns in the area. As part of the construction permitting process, development projects would be required to work with various City departments to develop detailed and coordinated construction logistics and contractor parking plan, as applicable, that would address construction vehicle routing, traffic control, transit movement, and movement of people walking and bicycling adjacent to the construction areas. Given the limited number of projects in the immediate vicinity of the project

site that would overlap with project construction, construction activities of cumulative projects would not result in significant cumulative construction-related transportation impacts.

Therefore, for the above reasons, the proposed project or project variants, in combination with cumulative development in San Francisco, would result in less-than-significant cumulative construction-related transportation impacts.

Improvement Measure I-TR-A: Construction Management Plan – Additional Measures, described above on p. 3.C.52, addresses potential for project overlap with other development or infrastructure projects.

Impact C-TR-2: The proposed project or project variants, in combination with cumulative projects, would not create potentially hazardous conditions. (*Less than Significant*)

Cumulative development projects near the project site are listed in **Table 3.A.1** and illustrated on **Figure 3.A.1: Cumulative Projects** (see pp. 3.A.7 and 3.A.9). Transportation network projects include the 16th Street Improvement Project and the Northeast Mission Parking Management Plan. As with the proposed project, other cumulative development projects would conform to the requirements of the Better Streets Plan, the Transit First Policy, and the TDM program, as applicable. The 16th Street Improvement Project, currently under construction, includes design features that would enhance safety for all ways of travel, including accessible pedestrian signals and visible crosswalks, new bus boarding islands, and bus bulbouts for easier and safer passenger boarding. As part of the Northeast Mission Parking Management Plan, on-street parking would be reconfigured on several blocks in the transportation study area where the 90-degree angle parking on both sides of the street does not allow for sufficient clearance for emergency vehicles. One side of the street would still have 90-degree angle parking but the other side of the street would be changed to parallel parking spaces. This would widen the available travel right-of-way for bicyclists and vehicles, including emergency vehicles.

Under cumulative conditions, trips by people walking, bicycling, or driving on the surrounding street network would increase due to the proposed project as well as other development projects identified above, and growth elsewhere in the City and region. This would generally be expected to lead to an increase in the potential for conflicts between people driving and people walking or bicycling, and public transit operations. However, a general increase in cumulative travel by all modes, in and of itself, would not be considered a potentially hazardous condition. Cumulative projects, including the proposed project or project variants, would be designed consistent with City policies and design standards, including the Better Streets Plan, and therefore would not create potentially hazardous conditions. Thus, no significant cumulative impacts related to potentially hazardous conditions would occur.

Therefore, for the above reasons, the proposed project or project variants, in combination with cumulative projects in San Francisco, would result in less-than-significant cumulative impacts related to potentially hazardous conditions for people walking, bicycling, or driving, or transit operations.

Impact C-TR-3: The proposed project or project variants, in combination with cumulative projects, would not interfere with accessibility. (*Less than Significant*)

Cumulative development projects near the project site are listed in **Table 3.A.1** and illustrated on **Figure 3.A.1: Cumulative Projects** (see pp. 3.A.7 and 3.A.9). Transportation network projects include the 16th Street Improvement Project and the Northeast Mission Parking Management Plan. The 16th Street Improvement Project would enhance transit operations along 16th Street and would promote walking, bicycling, and transit use. With implementation of the Northeast Mission Parking Management Plan, conditions for emergency vehicles would be enhanced through wider travel lanes on blocks in the transportation study area where 90-degree parking is currently provided on both sides of the street.

Overall, cumulative development and transportation projects would enhance the transportation network for all modes and would promote accessibility for people walking and bicycling within and through the study area by conforming to the requirements of the Better Streets Plan, Transit First Policy, and Vision Zero, and by adhering to planning principles that emphasize providing convenient connections and safe routes for people walking and bicycling. None of the known cumulative projects would affect vehicular circulation in the project vicinity and would not impede emergency access. Prior to finalizing the design and dimensions of any proposed transportation network changes, fire department and police department staff would review and approve streetscape modifications, as required, so that emergency vehicle access is acceptable. As a result, cumulative projects would not create impediments to accessibility or circulation for people walking or bicycling or create conditions inadequate for emergency access.

Under cumulative conditions, there would be a projected increase in vehicles on study area streets; however, the increase would not impede or hinder travel for people walking or bicycling, or emergency vehicles. Thus, no significant cumulative impacts related to accessibility would occur.

Therefore, for the above reasons, the proposed project or project variants, in combination with cumulative projects in San Francisco, would result in less-than-significant cumulative impacts related to accessibility of people walking or bicycling to and from the site and adjoining areas, and emergency access.

Impact C-TR-4: The proposed project or project variants, in combination with cumulative projects, would not substantially delay public transit. (*Less than Significant*)

Construction of the SFMTA's 16th Street Improvement Project is currently underway. This project's transit improvements include transit-only lanes, transit bulbouts, and new vehicle and pedestrian signals. The project is projected to improve transit reliability and travel time for the 22 Fillmore and 55 16th Street routes, which run along 16th Street, and would also reduce conflicts between private vehicles and transit vehicles. The proposed project would improve cumulative transit conditions by modernizing and expanding the trolley bus maintenance, fleet size, operation, and administrative services.

None of the known cumulative development projects would substantially affect vehicular circulation or increase p.m. peak hour vehicles trips in the project vicinity as to result in substantial transit delay. As a result, no significant cumulative transit impacts would occur.

Therefore, for the above reasons, the proposed project or project variants, in combination with cumulative projects in San Francisco, would result in less-than-significant cumulative transit impacts.

Impact C-TR-5: The proposed project or project variants, in combination with cumulative projects, would not cause substantial additional VMT or substantially induce automobile travel. (*Less than Significant*)

As stated in the approach to analysis, VMT by its very nature is largely a cumulative impact. As discussed in **Impact TR-5**, pp. 3.C.62-3.C.64, for existing plus project conditions, the proposed project would not exceed the project-level quantitative thresholds of significance for VMT. In addition, Plan Bay Area meets greenhouse gas reduction targets set by the California Air Resources Board. Furthermore, projected 2040 average daily VMT per capita for the TAZ in which the project site is located (i.e., TAZ 538) is below the projected 2040 regional average daily VMT. Specifically:

- For the residential uses, the projected 2040 average daily VMT per capita is 4.6, which is 71 percent below the 2040 projected regional average daily VMT per capita of 16.1.
- For the office uses (i.e., transit facility administrative and training and childcare uses), the projected 2040 average daily VMT per employee is 8.5, which is 50 percent below the 2040 projected regional average daily VMT per employee of 17.1.

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- For the retail uses, the projected 2040 average daily VMT per retail employee is 10, which is 31 percent below the 2040 projected regional average daily VMT per retail employee of 14.6.[44]

Thus, no significant cumulative VMT impacts would occur.

Therefore, for the above reasons, the proposed project or project variants, in combination with cumulative projects in San Francisco, would result in less-than-significant cumulative VMT and induced automobile travel impacts.

Impact C-TR-6: The proposed project or project variants, in combination with cumulative projects, would not result in significant loading impacts. (*Less than Significant*)

Cumulative development projects near the project site are listed in **Table 3.A.1** and illustrated on **Figure 3.A.1** (see pp. 3.A.7 and 3.A.9, respectively). Under cumulative conditions, freight and passenger loading activities on transportation study area streets would increase as a result of development projects; however, these activities would be in the vicinity of their respective sites and would not likely combine with the proposed project's loading demand.

As discussed under **Impact TR-6**, pp. 3.C.64-3.C.68, the proposed project's estimated freight and passenger loading demand would be accommodated within the proposed onsite and on-street commercial loading spaces and would not contribute to impacts from other development projects near the project site. The 1850 Bryant Street project would provide onsite freight loading accessed from Florida Street, and may include passenger loading on Bryant Street adjacent to the 1850 Bryant Street site (i.e., across the street from the project site), depending on the type of office uses that would occupy the building. Because the 1850 Bryant Street project will remove the existing curb cut on Bryant Street (i.e., vehicular access to the site will be via Florida Street), about 180 feet of curb frontage will be available on Bryant Street adjacent to the site to provide on-street passenger loading zones, if needed.

No other cumulative development projects have been identified that would contribute to either commercial vehicle or passenger loading demand on the project block. Thus, cumulative projects would not result in a substantial loading deficit and no significant cumulative loading impacts would occur. Therefore, for the above reasons, the proposed project or project variants, in combination with cumulative development in San Francisco, would result in less-than-significant cumulative loading impacts.

[44] Retail travel is not explicitly captured in San Francisco chained activity modeling process; rather, there is a generic "Other" purpose which includes retail shopping, medical appointments, visiting friends or family, and all other non-work, non-school tours. The retail efficiency metric captures all of the "Other" purpose travel generated by Bay Area households. The denominator of employment (including retail; cultural, institutional, and educational; and medical employment; school enrollment, and number of households) represents the size, or attraction, of the zone for this type of "Other" purpose travel.

D. NOISE AND VIBRATION

INTRODUCTION

EIR Section 3.D, Noise and Vibration, describes the existing noise environment in the project area; evaluates the potential for construction-related and operational noise and vibration impacts associated with implementation of the proposed project or project variants to adversely affect sensitive land uses; and identifies mitigation measures to avoid or reduce potential adverse impacts.

The analysis is based on ambient noise measurements from a nearby project[1] and review of applicable federal, state, and local noise-related regulations and standards. Noise calculations were prepared to quantitatively assess the noise increases that would be attributable to the proposed project or project variants; this information forms the basis of much of the assessment of noise impacts discussed in this section.

The noise impact methodologies and approaches to the analysis (described under "Approach to Analysis" on pp. 3.D.24-3.D.28) are based on a three-year construction program that would constitute maximum intensity of development on the site. As described in **EIR Chapter 2, Project Description**, p. 2.54, construction is estimated to start in 2023 and continue through 2026, lasting approximately three to four years. For purposes of CEQA, the noise analysis under a three-year timeframe (including potential phase overlaps) is the most reasonably conservative (or worst case) analysis because it assesses continuous construction over a shorter time period (i.e., more concentrated). There would be no change to the construction equipment used and duration of daily use; thus, a four-year construction program would not substantially change the magnitude or severity of any impact.

Issues identified in response to the Notice of Preparation (NOP) of an EIR and Notice of Public Scoping Meeting (**EIR Appendix A**) related to the proposed project's physical environmental impacts were considered in preparing this analysis. NOP comments related to noise and vibration focused on noise effects on nearby sensitive land uses and the noise limits in the San Francisco Noise Ordinance (see **EIR Chapter 1, Introduction**, pp. 1.3-1.5).

ENVIRONMENTAL SETTING

This subsection introduces the key concepts and terms that are used in the evaluation of noise and describes the existing noise environment of the project area.

[1] Due to changes in traffic patterns and reductions in transit use in response to COVID-19 and the subsequent issuance of the Mayor's Executive Directive requiring Shelter at Home protocols and ensuing business opening efforts, long-term and short-term noise measurements immediately adjacent to the project site were not collected. Ambient noise measurements from the 2000-2070 Bryant Street project (approximately 540 feet from the project site) collected prior to City actions taken in response to COVID-19 are used to characterize the existing ambient environment for Potrero Yard.

SOUND FUNDAMENTALS

Sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound. The decibel (dB) scale is used to quantify sound intensity. Noise is sometimes defined as unwanted sound, and the terms "noise" and "sound" are used more or less interchangeably in this analysis. The human ear responds to a very wide range of sound intensities. The dB scale used to describe sound is a logarithmic rating system which accounts for the large differences in audible sound intensities. When addressing the effects of noise on people, it is necessary to consider the frequency response of the human ear, or those frequencies that people hear the best. Noise-measuring instruments are therefore often designed to "weight" noises based on the way people hear. The frequency weighting most often used to evaluate environmental noise is "A weighting" because it best reflects how humans perceive noise. Measurements from instruments using this system, and associated noise levels, are reported in "A weighted decibels," or dBA. Using this scale, a change in noise level of 3 dBA is perceived as barely perceptible, 5 dBA is perceived as readily perceptible, and 10 dBA is perceived as a doubling or halving of noise loudness.[2] Therefore, a 70-dB sound level will sound about twice as loud as a 60-dB sound level. People generally cannot detect differences of 1 to 2 dB in a complex acoustical environment. A 5-dBA change is also required before any noticeable change in community response is expected.[3]

On this scale, a doubling of sound-generating activity (i.e., a doubling of the sound energy) causes a 3-dB increase in average sound produced by that source, not a doubling of the perceived loudness of the sound (which requires a 10-dB increase). For example, if existing traffic on a road is causing a 60-dB sound level at a nearby location, a doubling of the number of vehicles on this same road would cause the sound level at this same location to increase to 63 dB, i.e., a noise level change that is barely perceptible to most people.

For any noise source, several factors affect the efficiency of noise transmission traveling from the source, which in turn affects the potential noise impact at offsite locations. Important factors include distance from the source, frequency of the noise, absorbency and roughness of the intervening ground (or water) surface, the presence or absence of obstructions and their absorbency or reflectivity, and the duration of the noise. Noise transmission is further discussed under "Attenuation of Noise," p. 3.D.4. **Table 3.D.1: Representative Environmental Noise Levels** presents typical noise levels of some familiar noise sources and activities.

[2] California Department of Transportation (Caltrans), Division of Environmental Analysis, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, pp. 2-43 to 2-46 and Table 2-10, *https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf*, accessed May 5, 2021.

[3] Charles M. Salter Associates, Inc., Acoustics – Architecture, Engineering, the Environment, 1998, p. 63.

Table 3.D.1: Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 100 feet		
	100	
Gas Lawnmower at 3 feet		
	90	
Diesel Truck going 50 mph at 50 feet		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noise Urban Area during Daytime		
Gas Lawnmower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Area during Daytime	50	Dishwasher in Next Room
Quiet Urban Area during Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	30	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
	0	

Source: California Department of Transportation, Division of Environmental Analysis, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, p. 2-20.

Although a measured A-weighted noise level will adequately indicate the level of environmental noise at any instant in time, noise levels in populated communities typically vary by time. Several noise descriptors have been developed to characterize community noise by the total acoustical energy content of the noise over defined periods of time or by characterizing the loudest noise levels over a given time interval. Noise metrics used in this analysis are as follows:

L_{eq}: The equivalent sound level is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. An L_{eq} is a single number representing the level of a constant sound containing the same amount of sound energy as the varying sound levels over a specific period. Thus, the L_{eq} is the "energy average" noise level for the measurement time interval.

L_{dn}: A 24-hour sound level metric similar to a 24-hour L_{eq}, except the L_{dn} includes an additional 10 dBA added to sound levels in each hour between 10 p.m. and 7 a.m. to account for increased sensitivity to noise during times when people are typically trying to sleep.

L_{90}: The sound level exceeded 90 percent of a specified time interval, often one hour. The L_{90} may be used as a conservative representation of ambient sound levels.

L_{max}: The instantaneous maximum noise level measured during a defined time interval.

Noise from Multiple Sources

Because the measurement of sound pressure levels in decibels is based on a logarithmic scale, decibels cannot be added or subtracted in the usual arithmetical way. Adding a new noise source to an existing noise source, with both producing noise at the same level, will not double the noise level. For instance, if two identical noise sources each produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.[4]

Attenuation of Noise

Noise levels attenuate (decrease) with distance from the source. Transportation noise sources tend to be arranged linearly, such that roadway traffic attenuates at a rate of 3 to 4.5 dBA per doubling of distance from the source. Point sources of noise, including stationary, fixed, and idle mobile sources, like idling vehicles or construction equipment, can attenuate at a rate of 6 to 7.5 dBA per doubling of distance from the source. The 1.5 dBA variation in attenuation rates for these two noise sources can result from ground-absorption effects, which occur as sound travels over soft surfaces such as soft earth or vegetation versus hard ground such as pavement or very hard-packed earth.[5,6] Meaningful reductions or attenuation of noise levels can also be accomplished by "shielding" a noise source or providing a barrier, which may be in the form of an intervening structure or terrain, between the source and receptor.[7] With respect to the transmission of exterior noise to interior environments, noise attenuation effectiveness depends on exterior wall insulation, a window's sound transmission class rating, and whether windows are closed or open. Sound transmission class ratings indicate how well wall, ceiling, floor, door, and window assemblies attenuate airborne sound. It is not, however, a measurement of how many decibels of sound a wall can stop. For example, an exterior wall with a sound transmission class rating of 45 does not result in a 45 dB reduction of exterior-to-interior sound transmission. Generally, the higher the sound transmission class rating, the more sound is attenuated.[8]

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[4] Caltrans, Division of Environmental Analysis, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, p. 2-14, *https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf*, accessed November 6, 2020. Table 2-3 demonstrates the result of adding noise from multiple sources.

[5] Caltrans, Division of Environmental Analysis, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, pp. 2-27 to 2-28, *https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf*, accessed November 6, 2020.

[6] U.S. Housing and Urban Development, The Noise Guidebook, 1985, p. 24, *https://www.hudexchange.info/onecpd/assets/File/Noise-Guidebook-Chapter-4.pdf*, accessed November 6, 2020.

[7] Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006, Appendix A, *http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf*, accessed November 6, 2020.

[8] There is not a straightforward linear relationship between increasing STC and a reduction in exterior-to-interior noise because the amount of reduction varies considerably with the frequency range of noise.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed into the following categories:

- Interference with activities such as speech, sleep, and learning: Speech interference indoors occurs at about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating.[9] Outdoors, speech interference is generally higher than indoor fluctuating noise by about 15 dBA, or 70 dBA. Interior residential standards for multifamily dwellings are set by the state at 45 dB L_{dn}.[10] The state standard is designed for sleep and speech protection and the same criterion is applied to all residential uses. According to the World Health Organization, sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA (L_{eq}) or when intermittent interior noise levels reach or exceed 45 dBA (L_{max}), particularly if background noise is low. With a bedroom window slightly open (a reduction from outside to inside of 15 dB), the World Health Organization criteria would suggest exterior continuous (ambient) nighttime noise levels should be 45 dBA (L_{eq}) or below, and short-term events should not generate noise in excess of 60 dBA (L_{max}). The organization also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability to fall asleep. Exposure to noise levels greater than 85 dBA for 8 hours or longer can cause permanent hearing damage.[11]
- Subjective effects of annoyance, nuisance, and dissatisfaction:[12] The main causes for annoyance are interference with speech, radio and television, and house vibrations. The L_{dn} as a measure has been found to provide a valid correlation of noise level and the percentage of people annoyed. Three aspects of community noise are most important in determining subjective response: the level of sound, the frequency composition or spectrum of the sound, and the variation of sound level with time.[13]
- Physiological effects: Physiological effects include interference with sleep and rest, as well as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels).[14]
- Hearing loss: Hearing loss occurs mainly due to chronic exposure to excessive noise, but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.[15]

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[9] World Health Organization, Guidelines for Community Noise, Chapter 3, pp. 24-26, April 1999, *http://apps.who.int/iris/bitstream/10665/66217/1/a68672.pdf*, accessed May 5, 2021.

[10] Code of Federal Regulations, Title 24: Housing and Urban Development, Part 51, Environmental Criteria and Standards, Subpart B—Noise Abatement and Control, Section 51.101(a)(9).

[11] World Health Organization, Guidelines for Community Noise, Chapter 3, pp. 26-28, and Chapter 5, p. 65, April 1999, *http://apps.who.int/iris/bitstream/10665/66217/1/a68672.pdf,* accessed May 5, 2021.

[12] Annoyance, nuisance, and dissatisfaction are not environmental impacts under CEQA unless it interferes with sleep.

[13] World Health Organization, Guidelines for Community Noise, Chapter 3, pp. 32-34, and Chapter 4, pp. 38-39 and 42, April 1999, *http://apps.who.int/iris/bitstream/10665/66217/1/a68672.pdf*, accessed May 5, 2021.

[14] World Health Organization, Guidelines for Community Noise, Chapter 3, pp. 29-30, and Chapter 4, pp. 40-41, April 1999, *http://apps.who.int/iris/bitstream/10665/66217/1/a68672.pdf*, accessed May 5, 2021.

[15] World Health Organization, Guidelines for Community Noise, Chapter 3, pp. 21-24, April 1999, *http://apps.who.int/iris/bitstream/10665/66217/1/a68672.pdf*, accessed May 5, 2021.

FUNDAMENTALS OF GROUNDBORNE VIBRATION

Equipment that creates blows or impacts on the ground surface produces vibrational waves, called groundborne vibration, that radiate along the surface of the earth and downward into the earth, potentially resulting in effects that range from annoyance to structural damage. As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate by a few ten-thousandths to a few thousandths of an inch. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. Vibration levels decrease with increasing distance. The maximum rate or velocity of particle movement is the commonly accepted descriptor of the vibration "strength." This is referred to as the peak particle velocity (PPV) and is typically measured in inches per second.

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations reduce much more rapidly than low frequencies, so that low frequencies tend to dominate the spectrum as distance from the source increases. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances. When vibration encounters a building, the transfer of vibration from ground to the building foundation (referred to as "ground-to-foundation coupling") will usually reduce the overall vibration level; however, under certain circumstances, the ground-to-foundation coupling may also amplify the vibration level due to structural resonances of the floors and walls. High levels of vibration can damage fragile buildings or interfere with the operation of sensitive equipment. Depending on the age of the structure and type of vibration (transient, continuous, or frequent intermittent sources), vibration levels as low as 0.5 to 2.0 inches per second PPV (in/sec PPV) can damage a structure.

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below a level that would result in damage to a structure. Except for long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. People may tolerate infrequent, short-duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently. Human response to vibration often is described as the root-mean-square (RMS) velocity level and is denoted in the decibel scale, or VdB. The typical background level in residential areas is about 50 VdB, and most people cannot detect levels below about 65 VdB, and generally do not consider levels below 70 VdB, or approximately 0.1 PPV, to be an annoyance.[16] However, the duration of a vibration event has an effect on human response, as

[16] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, pp. 117-120, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

does its frequency. Generally, as the duration of a vibration event increases, the potential for adverse human response increases, particularly if the vibration event disturbs sleep. In addition, while people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration.

Vibration in buildings caused by construction activities may be perceived as motion of building surfaces or rattling of windows, items on shelves, and pictures hanging on walls. Vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range of vibration frequencies (i.e., 60 to 200 Hertz); when the structure and the construction activity are connected by foundations or utilities, such as sewer and water pipes; or when the airborne noise path is blocked, such as during tunneling activities.

EXISTING CONDITIONS

Existing Noise Sources

The project site is located in a mixed-use urban neighborhood with a variety of residential, commercial, open space, and production/distribution/ repair (PDR) uses (e.g., auto repair) in the immediate vicinity. The existing noise environment is dominated by traffic noise along several area roadways, including Bryant, 17th, Mariposa, and Hampshire streets, and non-revenue bus movements[17] into and within Potrero Yard. Existing noise sources on the project site include bus maintenance activities on the western portion of the site and along its north and west edges (e.g., bus storage, fare collection and running repair stations, and bus wash rack operations) and within the maintenance and operations building when exit and entry bays along Mariposa and 17th streets as well as its west elevation are open. Other noise sources also include miscellaneous neighborhood noises typical of an active urban area, such as voices and occasional car horns.

Ambient Noise Measurements

The San Francisco Planning Department (planning department) has published a map of background noise levels over the entire City.[18] This noise level map is intended to provide an overview of approximate existing noise levels throughout the City and is suitable to define general ambient noise conditions. The map, dated 2009, identifies ambient L_{dn} noise levels, across sound level

[17] Non-revenue bus travel (i.e., buses are not in service picking up and dropping off passengers; they are traveling to or from the facility and a terminus point where revenue service begins or ends) also includes movements within the yard and around the perimeter of the site to access the site from the Mariposa Street or 17th Street entrances.

[18] San Francisco Planning Department, Map 1: Background Noise Levels – 2009, 2009, *http://generalplan.sfplanning.org/images/I6.environmental/ENV_Map1_Background_Noise%20Levels.pdf*, accessed May 5, 2021.

ranges. According to the noise level map, existing noise levels along Bryant, 17th, and Mariposa streets range from about 65 to 70 dBA L_{dn} immediately adjacent to project site, with levels above 70 dBA L_{dn} along 17th Street near the intersections of Bryant and Hampshire streets and Bryant and 17th streets. Along Hampshire Street and on the 4.4-acre project site, the map shows existing noise levels range from about 55 to 65 dBA.

Due to changes in traffic patterns and reductions in transit use in response to the COVID-19 pandemic and the subsequent issuance of the Mayor's Executive Directive requiring Shelter at Home protocols and ensuing business opening efforts, the department directed the impact analysis to use ambient noise measurements taken in the project vicinity before this period of changes in traffic patterns and reductions in transit. Furthermore, the 2009 background noise levels shown on the planning department's map may not represent current ambient noise conditions. Because of this, ambient noise measurements collected for a nearby project (2000-2070 Bryant Street, between 18th and 19th streets) were used to characterize the existing ambient noise environment in the vicinity of the project site for this project analysis.[19] The proxy measurement locations are shown in **Figure 3.D.1: Sensitive Receptors and Noise Measurement Locations**. The department determined that the long- and short-term ambient noise measurements taken in 2013 and located between 540 feet (LT [Long-Term]-2 in **Figure 3.D.1**) and 840 feet (ST [Short-Term]-1 in **Figure 3.D.1**) south of the project site along Bryant and Florida streets provide a reasonably accurate reflection of local traffic conditions prior to the COVID-19 shelter-in-place order. The measurement locations along Bryant and Florida streets also capture ambient noise generated by a similar set of land uses as those adjacent to the project site (except for the Franklin Square open space). Since the project site and its vicinity are well developed and a large increase in growth that could lead to substantial increase in traffic is not anticipated in the area, for the purpose of this analysis, the existing noise levels at the project site and its vicinity are assumed to be similar to those collected in 2013 for the nearby project.

Table 3.D.2: Summary of Long-Term (LT) Noise Monitoring Results in the Project Vicinity and **Table 3.D.3: Summary of Short-Term (ST) Noise Monitoring Results in the Project Vicinity** present the results of the long-term and short-term noise measurement surveys collected for the 2000-2070 Bryant Street project, respectively. Long-term measurements were conducted over a 48-hour period while short-term measurements were conducted for 15-minute periods. Different noise metrics were collected during long-term measurements and short-term measurements to characterize ambient noise. As shown in the tables, long-term measurements range from 69 to 72 dBA L_{dn}, and short-term measurements range from 57 to 65 dBA L_{eq} and 52 to 57 dBA L_{90}.

[19] San Francisco Planning Department, email to San Francisco Planning Department Qualified Environmental Consultant Pool and Acoustical Consultants, re: Noise Monitoring During Shelter In Place, May 14, 2020.

Source: Baseline Environmental Consulting, 2020

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FIGURE 3.D.1: SENSITIVE RECEPTORS AND NOISE MEASUREMENT LOCATIONS

Table 3.D.2: Summary of Long-Term (LT) Noise Monitoring Results in the Project Vicinity (dBA)

Site #	Location	Average L_{dn} (dBA)
LT-1	Florida and 18th streets, southeast corner of intersection	69
LT-2	Bryant and 18th streets, southwest corner of intersection	72
LT-3	West side of Bryant Street, 760 feet south of the project site	70

Notes: Measurements began between 10:30 – 11:00 AM on 12/8/2014 and ended at approximately 11 AM on 12/10/2014. All values are in units of dBA.

Source: 2000-2070 Bryant Street Project – Final Noise Study Case No. 2013.0677E, March 26, 2015. See **EIR Appendix F-2, Sound Level Measurement Data**.

Table 3.D.3: Summary of Short-Term (ST) Noise Monitoring Results in the Project Vicinity (dBA)

Site #	Location	L_{eq}	L_{90}
ST-1	681 Florida Street	56.7	51.7
ST-2	650-D Florida Street	57.8	51.6
ST-3	Opposite side of the street from 2828 18th Street	62.4	54.6
ST-4	West side of Bryant Street, 650 feet south of the project site	64.9	57.1

Notes: Measurements were conducted between 11:45 AM and 1:30 PM on 12/10/2014. All values are in units of dBA.

Source: 2000-2070 Bryant Street Project – Final Noise Study Case No. 2013.0677E, March 26, 2015. See **EIR Appendix F-2**.

Existing Groundborne Noise and Vibration Sources

There are no known sources of existing groundborne noise and vibration in the vicinity of the project site. Heavy truck and bus traffic (or rubber-tired traffic) along area roadways generates airborne noise and surface vibration. However, the levels of vibration from these sources are negligible and typical of vibration levels generated along urban roadways. There is no machinery or activity at the adjacent residential, commercial, and PDR uses that generate vibration on the project site.

EXISTING NOISE-SENSITIVE LAND USES

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and, at high levels of noise, hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others.

Land uses are considered noise "sensitive receptors" where low noise levels are necessary to preserve their intended goals such as relaxation, education, health, and general state of well-being.

Noise-sensitive receptors include residents, hospitals, convalescent homes, schools, churches, hotels, and motels.[20]

[20] Governor's Office of Planning and Research, State of California 2017 General Plan Guidelines, 2017, p. 136, *http://www.opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf*, accessed May 5, 2021.

Noise-sensitive land uses in the immediate vicinity of the project site include residential uses and two preschools (see **Table 3.D.4: Existing Sensitive Receptors in the Project Vicinity** and **Figure 3.D.1**, p. 3.D.9). These receptors range in distance to the nearest portion of the site from 50 to 280 feet. There are no existing hospitals or skilled nursing facilities in the project vicinity.

Table 3.D.4: Existing Noise Sensitive Receptors in the Project Vicinity

Receptor ID NOTE A	Type of Sensitive Receptor	Location	Minimum Approximate Distance from Site NOTE B
R1	Residential	2501 Mariposa Street	66 feet south
R2	Residential	475 Hampshire Street	80 feet east
R3	Residential	1800 Bryant Street	80 feet west
R4	Residential	1900 Bryant Street	100 feet southwest
R5	Residential	2445 Mariposa Street	100 feet southeast
R6	Residential	480 Potrero Avenue	185 feet east
R7	Residential	1746 to 1712 Bryant Street and 2401 16th Street, with the closest location at 1746 Bryant Street	200 feet northwest
R8	Residential	2726 17th Street	220 feet northwest
R9	Preschool	2730 17th Street	245 feet northwest
R10	Preschool	1960 Bryant Street	280 feet southwest

Notes:

[A] Receptor locations, proposed buildings, and project construction boundaries were approximated based on existing aerial imagery and drawings provided by the SFMTA. Receptors were selected to represent the variation in noise levels around the project site due to project construction and operation.

[B] Distances between R1, R2, and R3 and project site boundaries provided by the SFMTA on an existing site plan with dimensions based on a site survey by the City's Bureau of Street Use and Mapping. Other measurements are representative of the distance, rounded to the nearest 5 feet, between the receptors and project construction boundaries as illustrated in **Figure 3.D.1**, p. 3.D.9. Measured using a geographic information system software, including locations of building footprints, to calculate the nearest distance between objects (receptors, buildings, etc.).

Source: SFMTA, 2019; Baseline, 2020.

EXISTING VIBRATION-SENSITIVE LAND USES

Vibration-sensitive receptors may include structures (especially older masonry structures), people (especially residents, the elderly, and the sick), and equipment (e.g., magnetic resonance imaging equipment, high resolution lithographic, optical and electron microscopes).[21,22] As noted above, there are no existing hospitals or skilled nursing facilities in the project vicinity. The closest building to the project site is located 66 feet to the south across Mariposa Street (2601 Mariposa Street). There are no adjacent historic resources. The existing historic resource on the site would not be retained. The closest off-site historic resources in the vicinity of the project site are the

[21] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

[22] Preschools are not considered as vibration-sensitive receptors in this analysis.

Leyser-Green Co. Building at 2401-2425 17th Street (80 feet to the east of the project site), the SGI Cultural Center at 2450 17th Street (110 feet to the northeast of the project site), and the Verdi Club at 2424 Mariposa Street (130 feet to the east of the project site).[23] (See **Table 3.D.5: Existing Vibration Sensitive Receptors in the Project Vicinity**.) Nearby residences are listed in **Table 3.D.4**. The closest residence is at 2501 Mariposa Street, directly across from the Mariposa Street bus exit bays.

Table 3.D.5: Existing Vibration Sensitive Receptors in the Project Vicinity

Location	Type of Sensitive Receptor	Minimum Approximate Distance from Site [NOTE A]
2601 Mariposa Street (KQED Building)	Broadcasting and Recording Studios	66 feet south
2401-2425 17th Street (Leyser-Green Co. Building)	Historic Structure	80 feet east
2450 17th Street (SGI Cultural Center)	Historic Structure	110 feet northeast
2424 Mariposa Street (Verdi Club)	Historic Structure	130 feet east

Notes:
[A] Distances between the receptors and project construction boundaries provided by the SFMTA on an existing site plan with dimensions based on a site survey by the City's Bureau of Street Use and Mapping. Other measurements are representative of the distance, rounded to the nearest 5 feet, as illustrated in **Figure 3.D.1**, p. 3.D.9. Measured using a geographic information system software, including locations of building footprints, to calculate the nearest distance between objects (receptors, buildings, etc.).

Source: SFMTA, 2019; Baseline, 2020.

The building at 2601 Mariposa Street (66 feet to the south of the project site) is the headquarters for KQED, which is a public media station that includes recording studios. According to the most current information from outreach efforts conducted for this analysis, the KQED building contains vibration-sensitive equipment related to audio, visual, and digital production processes for television and radio broadcasting and related on-site operations.[24] It should be noted that the KQED building was recently seismically upgraded and therefore is considered a modern commercial building. Based on review of a geotechnical report prepared for the proposed upgrades to the KQED building, the subsurface condition of the building would allow an approximately 10 VdB of vibration attenuation (coupling to building foundation).[25,26]

[23] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, San Francisco, October 2, 2017 (see **EIR Appendix D-1**).

[24] Scott Lewis, KQED, telephone conversation with Chelsea Fordham-Principal Planner at San Francisco Planning Department, Peter Mye-Senior Planner at SWCA, and Lisa Luo-Environmental Engineer at Baseline Environmental Consulting, December 4, 2020.

[25] Langan, Geotechnical Investigation, KQED, 2601 Mariposa Street, San Francisco, California, October 30, 2018.

[26] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

REGULATORY FRAMEWORK

FEDERAL REGULATIONS AND GUIDELINES

This section identifies applicable federal regulations and guidelines related to noise and vibration.

United States Environmental Protection Agency

In 1972, the Noise Control Act (42 United States Code [U.S.C.] section 4901 et seq.) was passed by Congress to promote noise environments in support of public health and welfare. It also established the U.S. Environmental Protection Agency Office of Noise Abatement and Control to coordinate federal noise control activities. The Office of Noise Abatement and Control established guidelines for noise levels that would be considered safe for community exposure without the risk of adverse health or welfare effects. However, in 1982, the agency phased out the office's funding as part of a shift in federal noise control policy that transferred the primary responsibility of regulating noise to state and local governments.

Based on the agency's recommendations for noise-sensitive areas, to prevent measurable hearing loss over the lifetime of a receptor the yearly average (L_{eq}) should not exceed 70 dBA. Additionally, to prevent substantial interference of activities and annoyance in noise-sensitive areas, the daily average (L_{dn}) should not exceed 55 dBA outdoors or 45 dBA indoors. Based on attitudinal surveys, the agency determined that, relative to a baseline noise exposure level of 55 dBA L_{dn}, a 5 dBA increase in L_{dn} is the minimum required for a change in community reaction.[27] These criteria are consistent with the City's noise ordinance section 2909(d), which establish residential interior noise limits from fixed noise sources of 45 and 55 dBA during the night and daytime, respectively (discussed below under "Other Local Regulations," pp. 3.D.21-3.D.23).

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under Title 40 of the Code of Federal Regulations, Part 205, Subpart B. The federal truck passby noise standard is 80 dBA at 50 feet from the vehicle pathway centerline, under specified test procedures. These requirements are implemented through regulatory controls on truck manufacturers. There are no comparable standards for vibration, which tend to be specific to the roadway surface, the vehicle load, and other factors.

The Noise Control Act also directed federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. Although the agency was given a major role in disseminating information to the public and coordinating with federal agencies, each federal agency retained authority to adopt noise regulations pertaining to agency programs. The Environmental

[27] U.S. Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, p. 3.

Protection Agency can, however, require federal agencies to justify their noise regulations in terms of Noise Control Act policy requirements.

United States Federal Transit Administration

The United States Federal Transit Administration's (FTA's) Transit Noise and Vibration Impact Assessment Manual establishes general methodology guidelines and impact criteria for assessment of construction noise impacts for transit projects. It is not a regulation but does function as one of the few federal sources that suggest both a methodology and guidelines for assessing noise impacts from construction activities.[28] The FTA Manual does not contain standardized criteria for assessing construction noise impacts but includes noise limit thresholds at land uses that, when exceeded, may result in an adverse community reaction. Guidelines are provided for both general assessment and detailed assessments of construction noise. As a reasonable worst-case scenario, this methodology calls for estimating a combined noise level from the simultaneous and side-by-side operation of the two noisiest pieces of equipment expected to be used in each construction phase.

When using the above method to estimate construction sound levels, in general, no substantial adverse reaction would be expected if the calculated hourly L_{eq} were to remain at or below 90 dBA L_{eq} at the nearest noise-sensitive residential receptors during daytime hours and 80 dBA at night (see **Table 3.D.6: FTA General Assessment Construction Noise Impact Criteria**).[29] These criteria are absolute contribution values from construction activity, and are independent of existing background noise levels. If the FTA criteria are exceeded, adverse noise impacts could occur.

Table 3.D.6: FTA General Assessment Construction Noise Impact Criteria

Land Use	Maximum 1-Hour dBA L_{eq} [NOTE A]	
	Day [NOTE B]	Night [NOTE C]
Residential	90	80
Commercial	100	100
Industrial	100	100

Notes:
[A] dBA = A-weighted decibels; Leq = average or constant sound level.
[B] Day = 7 a.m. to 10 p.m.
[C] Night = 10 p.m. to 7 a.m.

Source: Federal Transit Administration. Transit Noise and Vibration Impact Assessment Manual, September 2018, Table 7-2, p. 179.

Although not a regulation, the FTA's Transit Noise and Vibration Impact Assessment Manual also provides guidance on the evaluation of building damage and human response to different levels of

[28] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

[29] Although this Federal Transit Administration standard is specifically applicable to residential receptors, this standard can be applied to other noise-sensitive receptors including school students.

construction-related groundborne vibration.[30] It functions as one of the few federal sources that provide guidance on the evaluation and assessment procedures and impact criteria for groundborne vibration induced by construction equipment. **Table 3.D.7: FTA Vibration Threshold Guidelines for Potential Damage to Structures** summarizes the FTA vibration guidelines used to assess the potential for damage to structures, based on vibration PPV levels, with the potential for damage based on building category types (i.e., the fragility or strength of a building structure).

Table 3.D.7: FTA Vibration Threshold Guidelines for Potential Damage to Structures

Building Category	Peak Particle Velocity (in/sec)
I. Reinforced-concrete, steel, or timber buildings (no plaster)	0.08
II. Engineered concrete and masonry buildings (no plaster)	0.1
III. Non-engineered timber and masonry buildings	0.25
IV. Buildings that are extremely susceptible to vibration damage	0.3

Notes: in/sec = inches per second

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, Table 7-5, p. 186.

To avoid temporary annoyances for building occupants or interference with vibration-sensitive equipment inside special-use buildings during construction, the FTA recommends using the vibration criteria from the guidance manual for a groundborne vibration assessments. **Table 3.D.8: Indoor FTA Groundborne Vibration Impact Criteria** summarizes the FTA's general assessment criteria used to evaluate potential interference to building operations by different levels of construction-generated ground-borne vibration and ground-borne noise (e.g., vibration that causes a structure to vibrate and re-radiate noise into a room). The criteria address annoyance related to interference with interior operations, sleep, and institutional daytime use as a function of the frequency of the vibration event according to the three land use categories, with particular attention to special buildings such as special-use facilities that are very sensitive to groundborne vibration.

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[30] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

Table 3.D.8: Indoor FTA Groundborne Vibration Impact Criteria

Land Use Category	Impact Levels (VdB relative to 1 micro-inch/sec) [NOTE A]		
	Frequent Events [NOTE B]	Occasional Events [NOTE C]	Infrequent Events [NOTE D]
Category 1: Buildings where vibration would interfere with interior operations	65 [NOTE E]	65 [NOTE E]	65 [NOTE E]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime use	75	78	83
Special Buildings [NOTE F]	65-72	65-80	65-80

Notes:
[A] The standard reference quantity for vibration velocity in the USA and used by the U.S. Department of Transportation is 1 x 10^{-6} inches/second, or 1 micro-inch/second.
[B] Frequent: More than 70 vibration events of the same source per day.
[C] Occasional: Between 30 and 70 vibration events of the same source per day.
[D] Infrequent: Less than 30 vibration events of the same source per day.
[E] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels.
[F] This category includes special-use facilities that are very sensitive to vibration and noise that are not included in the categories above and require special consideration. However, if the building will rarely be occupied when the source of the vibration (e.g., the train) is operating, there is no need to evaluate for impact. Examples of these facilities include concert halls, TV and recording studios, and theaters.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, Tables 6-3 and 6-4, p. 126.

STATE REGULATIONS AND GUIDELINES

This section identifies applicable state regulations and guidelines related to noise and vibration.

General Plans

California Government Code section 65302 encourages each local government entity to implement a noise element as part of its general plan.[31] In addition, the California Governor's Office of Planning and Research has developed guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The City and County of San Francisco has developed guidelines that are described below in "Local Regulations and Guidelines," pp. 3.D.19-3.D.23.

[31] California Government Code, Title 7, Division 1, Chapter 3, Section 65302(f)(1), June 27, 2017, *https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=65302.*, accessed May 5, 2021.

California Noise Insulation Standards

The 2019 California Building Code (California Code of Regulations title 24, part 2) requires that walls and floor/ceiling assemblies separating dwelling units from each other, or from public or service areas, have a sound transmission class (STC) of at least 50, meaning they can reduce noise by a minimum of 50 dB.[32] Building Code section 1206.4, Allowable Interior Noise Levels, also specifies a maximum interior noise limit of 45 dBA (L_{dn} or Community Noise Equivalent Level [CNEL]) in habitable rooms, and requires that common interior walls and floor/ceiling assemblies meet a minimum STC rating of 50 for airborne noise.

San Francisco has adopted the 2019 Green Building Standards Code (also part of the State Building Code; California Code of Regulations title 24, part 11, more commonly known as "Title 24"), which specifies the following insulation standards for Environmental Comfort (section 5.507) to minimize exterior noise transmission into interior spaces for nonresidential buildings:

- Section 5.507.4.1, Exterior Noise Transmission, requires wall and roof-ceiling assemblies to have an STC of at least 50 and exterior windows to have a minimum STC of 30 for any of the following building locations: (1) within the 65 dBA, L_{dn}, noise contour of a freeway, expressway, railroad, or industrial source; and (2) within the 65 dBA noise contour of an airport. Exceptions include buildings with few or no occupants and where occupants are not likely to be affected by exterior noise, such as factories, stadiums, parking structures, and storage or utility buildings.
- Sections 5.507.4.1.1 and 5.507.4.3 require nonresidential buildings to be designed with exterior walls and roof-ceiling assemblies that have an STC rating of at least 45 to provide an acceptable interior noise level of 50 dBA (L_{eq}) in occupied areas during any hour of operation.
- Section 5.507.4.2, Interior Sound, requires wall and floor-ceiling assemblies separating tenant spaces and separating tenant spaces and public places to have an STC of at least 40.

These requirements are collectively known as the California Noise Insulation Standards and are enforced by the San Francisco Department of Building Inspection.

California Department of Transportation

The California Department of Transportation (Caltrans) has published several documents characterizing assessment procedures and impact criteria related to traffic noise and groundborne vibration. Caltrans published the Technical Noise Supplement to the Traffic Noise Analysis Protocol in September 2013, which describes the measurement, modeling, and noise impact assessment procedures for evaluating noise from traffic. The document states the following:

[32] State Building Code section 1206.3.

> "Changes in noise levels are perceived as follows: 3 dBA as barely perceptible, 5 dBA as readily perceptible, and 10 dBA as a doubling or halving of noise."[33]

There are no state regulations related to construction-induced groundborne vibration; however, Caltrans has provided guidance on the evaluation and impact criteria related to groundborne vibration induced by construction equipment, as documented in the Transportation and Construction Vibration Guidance Manual dated April 2020.[34] **Table 3.D.9: Caltrans Vibration Guidelines for Potential Damage to Structures** summarizes the Caltrans vibration guidelines used to assess the potential for damage to structures, based on vibration PPV levels, with the potential for damage based on building types (i.e., the fragility or strength of a building structure) and whether the vibration is transient or continuous or frequent.

Table 3.D.9: Caltrans Vibration Guidelines for Potential Damage to Structures

Structure Type and Condition	Maximum Peak Particle Velocity (in/sec)	
	Transient Sources [NOTE A]	Continuous/Frequent Intermittent Sources [NOTE B]
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes: in/sec = inches per second
[A] Transient sources create a single, isolated vibration event, such as blasting or drop balls.
[B] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans, Transportation and Construction Vibration Guidance Manual, 2020 Update, April 2020, Table 19, p. 38.

As indicated **Table 3.D.9**, the building damage criteria for continuous vibration sources are about half of the criteria for transient sources. These criteria differ from the FTA criteria shown in **Table 3.D.7**, p. 3.D.15, in that all construction activities are treated the same by the FTA, while the Caltrans criteria consider continuous or frequent intermittent sources that could increase the risk of building damage.

Ground-borne vibration and noise can also disturb people, who are generally more sensitive to vibration during nighttime (sleeping) hours than during daytime (waking) hours. Numerous studies have been conducted to characterize the human response to vibration. **Table 3.D.10: Caltrans**

[33] Caltrans, Division of Environmental Analysis, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, p. 6-5, *https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf*, accessed May 5, 2021.
[34] Caltrans, Division of Environmental Analysis, Transportation and Construction Vibration Manual, 2020 Update, April 2020, p. 38, *https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf*, accessed May 24, 2021.

Guidelines for Vibration Annoyance Potential provides Caltrans' guidelines regarding vibration annoyance potential (expressed here as PPV).

Table 3.D.10: Caltrans Guidelines for Vibration Annoyance Potential

Human Response	Maximum Peak Particle Velocity (in/sec)	
	Transient Sources [NOTE A]	Continuous/Frequent Intermittent Sources [NOTE B]
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Notes: in/sec = inches per second
[A] Transient sources create a single, isolated vibration event, such as blasting or drop balls.
[B] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans, Transportation and Construction Vibration Guidance Manual, 2020 Update, April 2020, Table 20, p. 38.

LOCAL REGULATIONS AND GUIDELINES

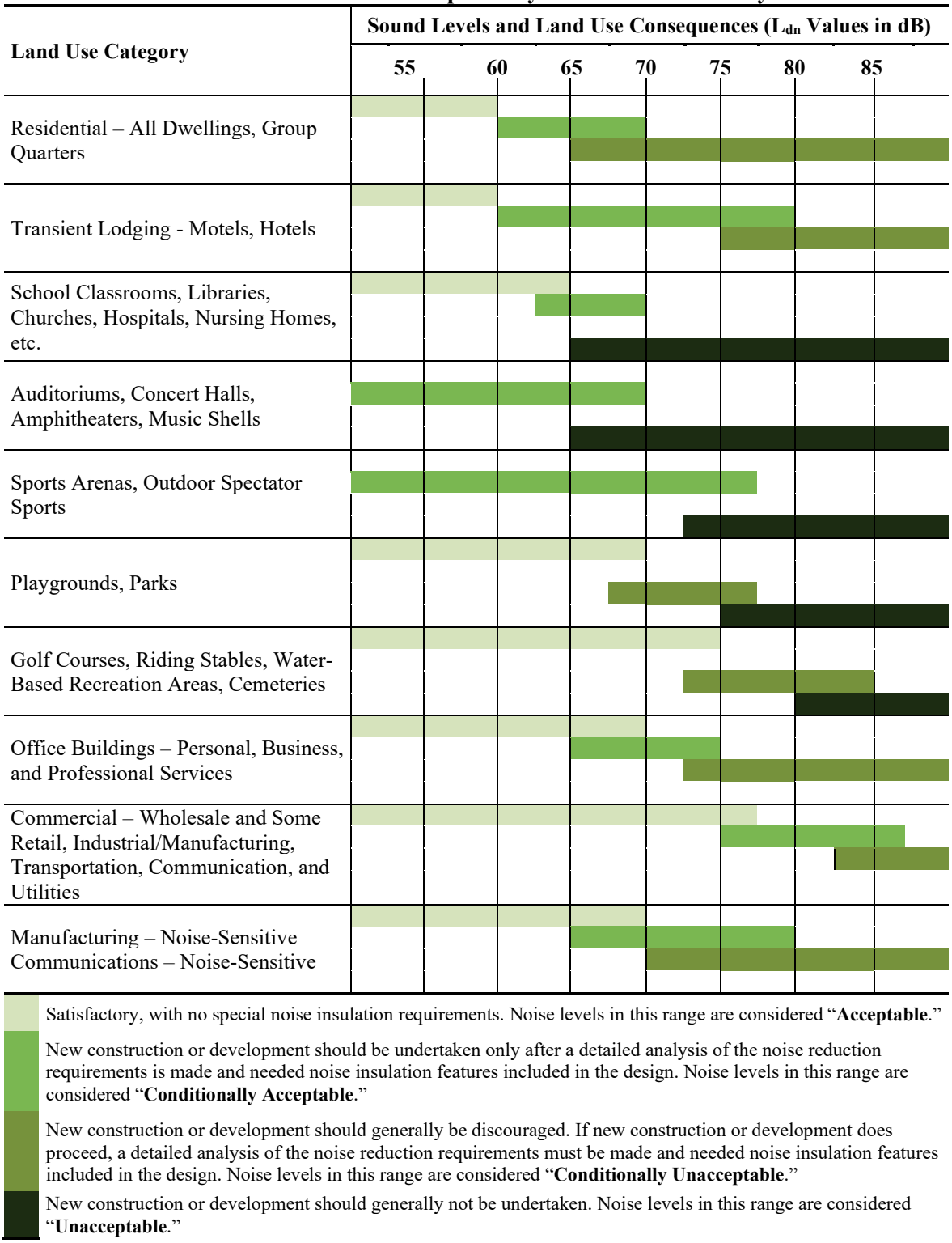
San Francisco General Plan

Environmental Protection Element

The Environmental Protection Element of the San Francisco General Plan contains a "Land Use Compatibility Guidelines for Community Noise" figure for determining the compatibility of various new uses with different noise levels. These guidelines, which are similar to state guidelines set forth by the Governor's Office of Planning and Research, indicate maximum acceptable noise levels for various land uses, which are presented in **Table 3.D.11: San Francisco Land Use Compatibility Chart for Community Noise**. Although this table presents a range of noise levels that are considered compatible or incompatible with new uses, the maximum "satisfactory, with no special insulation requirements" exterior noise level is 60 dBA (L_{dn}) for residential and hotel uses; 65 dBA (L_{dn}) for school classrooms, libraries, churches, and hospitals; 70 dBA (L_{dn}) for playgrounds, parks, office uses, retail commercial uses, and noise-sensitive manufacturing/ communications uses; and 77 dBA (L_{dn}) for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities.

The Environmental Protection Element includes the following objectives and policies that pertain to noise: impose traffic restrictions to reduce transportation noise; discourage changes in streets which will result in greater traffic noise in noise-sensitive areas; minimize impact of noise on affected areas; promote site planning, building orientation and design, and interior layout that lessen noise intrusion; promote the incorporation of noise insulation materials in new construction; construct physical barriers to reduce noise transmission from heavy traffic carriers; and promote land uses that are compatible with various transportation noise levels.

Table 3.D.11: San Francisco Land Use Compatibility Chart for Community Noise



Satisfactory, with no special noise insulation requirements. Noise levels in this range are considered "**Acceptable**."

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Noise levels in this range are considered "**Conditionally Acceptable**."

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Noise levels in this range are considered "**Conditionally Unacceptable**."

New construction or development should generally not be undertaken. Noise levels in this range are considered "**Unacceptable**."

Mission Area Plan

The area plan contains general objectives and policies to ensure the compatibility of land uses within the plan area requiring that general plan noise requirements be met (Objective 1.5) and acknowledge that existing PDR uses along with traffic are sources of noise within the plan area. Area plan policies 1.5.1 and 1.5.2 point out the importance of accurate background noise level data collection and thoughtful siting of sensitive land uses and noise-generating land uses. The site is in an area formerly known as the Northeast Mission Industrial Zone, which has a larger proportion of PDR uses than other geographies of the area plan.

Other Local Regulations

San Francisco Noise Ordinance

The City regulates noise through Article 29 of the San Francisco Police Code, which states that the City's policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power.[35] Police Code section 2900 makes the following declaration with regard to community noise levels: "It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's Guidelines on Community Noise."

Police Code article 29, sections 2907 and 2908, regulate construction equipment and construction work at night, while section 2909 provides for limits on any machine, or device, music or entertainment, or any combination of such sources. Sections 2907 and 2908 are enforced by the San Francisco Department of Building Inspection, and section 2909 is enforced by the San Francisco Department of Public Health. Summaries of these and other relevant sections are presented below.

Noise limits specific to construction activities are described in sections 2907(a) and 2908:

- Section 2907(a) limits noise from construction equipment to 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions from this requirement include impact tools with approved mufflers, pavement breakers and jackhammers with approved acoustic shields, and construction equipment used in connection with emergency work.
- Section 2908 prohibits nighttime construction (between 8 p.m. and 7 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless a special permit has been issued by the City.

[35] City and County of San Francisco, San Francisco Police Code Article 29: Regulation of Noise Guidelines for Noise Control Ordinance Monitoring and Enforcement, December 2014 Guidance, *https://www.sfdph.org/dph/files/EHSdocs/ehsNoise/GuidelinesNoiseEnforcement.pdf*, accessed November 6, 2020.

Noise limits specific to operational activities are described in section 2909:

- Section 2909(a) establishes a limit of 5 dBA above the local ambient noise level at the property plane of residential or within multi-unit residential properties.
- Section 2909(b) establishes a limit of 8 dBA above the local ambient noise level at the property plane of commercial, mixed use, or industrial properties.
- Section 2909(c) establishes a limit of 10 dBA above the local ambient noise level at a distance of 25 feet or more from public property, unless the machine or device is being operated to serve or maintain the property or as otherwise provided in the noise ordinance.
- Section 2909(d) establishes an interior noise limit for fixed noise sources at the nearest sensitive receptor of 45 dBA at night (10 p.m. to 7 a.m.) or 55 dBA during the day (7 a.m. to 10 p.m.) inside any sleeping or living room in any dwelling unit located on residential property to prevent sleep disturbance, with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

Noise limits specific to waste disposal services are described in section 2904:

- Section 2904: Noise from waste disposal services, including from garbage trucks, shall be limited to a sound level of 75 dBA at a distance of 50 feet. This limit does not apply to crushing, impacting, dropping, or moving garbage on the truck, but only to the truck's mechanical processing system.

The City's Guidelines for Noise Control Ordinance Monitoring and Enforcement, revised in December 2014, clarifies the definition of *ambient* as the L_{90} (the level of noise exceeded 90 percent of the time), and this noise descriptor is considered to be a conservative representation of the ambient noise level under most conditions. Ordinance compliance is determined by measuring the L_{90} for 10 minutes, with and without the noise source at issue. Use of the L_{90} descriptor is appropriate when determining code compliance of a fixed noise source (such as mechanical equipment). It is not appropriate for other aspects of a CEQA noise impact analysis such as noise created by automobile traffic, which determines noise compatibility based on L_{dn} or CNEL, a different noise descriptor (as described above under "Sound Fundamentals," starting on p. 3.D.2).

San Francisco Public Works Standard Construction Measures

As discussed in **EIR Chapter 2, Project Description**, p. 2.49, the proposed project or project variants would be subject to public works' standard construction measures (SCMs) (see **Table 2.3: San Francisco Public Works Standard Construction Measures**, pp. 2.50-2.53, and **EIR Appendix C**). The SFMTA or private project co-sponsor would implement **SCM #5, Noise**, and **SCM #9, Cultural Resources**, as part of the proposed project or project variants, including the following applicable to construction noise and vibration:

- All projects will comply with local noise ordinances regulating construction noise. Public Works shall undertake measures to minimize noise disruption to nearby neighbors and sensitive receptors during construction. These efforts could include using best available noise control technologies on equipment (i.e., mufflers, ducts, and acoustically attenuating

shields), locating stationary noise sources (i.e., pumps and generators) away from sensitive receptors, erecting temporary noise barriers, and other such measures.

- During nighttime construction activities, the following shall apply: impact tools and vibratory pile drivers shall have intake exhaust mufflers and/or acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works; the construction contractor shall avoid using water blasters; the use of vehicles that are legally required to be equipped with backing warning alarms will be reduced to the extent feasible; and administrative controls as defined in the California Code of Regulations, Title 8 section 1592 will be used for worker protection for backing movements by other vehicles. Hours of vibration-intensive activities, such as vibratory pile driving, shall be restricted to between 7 a.m. and 8 p.m.

SCM #9, Cultural Resources, also includes construction-related vibration control procedures (see Vibration Control Procedures for Inclusion in Construction Contracts in **EIR Appendix C**), which are refined to be project specific. These vibration control procedures require a vibration control plan to be prepared, submitted, and approved at least 30 days prior to the start of construction. At a minimum, the vibration control plan must identify vibration-sensitive resources; standards for vibration thresholds that are not to be exceeded by construction activities; real-time activity monitoring to identify when vibration levels approach the predetermined value at which damage could occur; requirements to immediately cease construction activities when vibration levels reach levels at which damage could occur; and procedures for restoring resources to their pre-construction condition should damage occur as a result of construction-related vibration. Vibration-sensitive resources are identified in consultation with the planning department. Such resources could include buildings of modern construction, historic buildings, structures, or resources identified as vibration-sensitive given the types of construction activities and the distance between such activities and the resource.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The department uses criteria for determining the significance of impacts in this analysis consistent with the environmental checklist in Appendix G of the State CEQA Guidelines. A project would have a significant effect related to noise and vibration if implementation of the project would do any of the following:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or
- Generate excessive groundborne vibration or groundborne noise levels.

APPROACH TO ANALYSIS

This analysis evaluates the noise and vibration impacts associated with construction and operation of the proposed project or project variants. Two types of noise and vibration impacts were considered: short-term, temporary impacts resulting from project construction activities, and impacts due to long-term operational changes in the noise environment. The analysis assumes that requirements of public works' SCMs are included in contracts for construction contractors working on the project (see **EIR Appendix C**).

During construction, noise from construction activities and equipment could expose nearby existing offsite sensitive receptors to temporary increases in noise levels that exceed ambient levels. Construction noise levels would vary from day to day, depending on a number of factors, including the quantity and condition of the equipment being used, the types and duration of activity being performed, the distance between the noise source and the receptor, and the presence or absence of barriers, if any, between the noise source and the receptor. In addition to onsite construction activities, trucks hauling materials to and from the project site may result in increased levels of offsite noise. Construction activities can also result in varying degrees of groundborne noise and groundborne vibration, depending on the equipment, activity, and soil conditions.

Operational noise from the proposed project would result primarily from onsite stationary sources, other onsite sources associated with the proposed project (i.e., bus maintenance activities, vehicle movements, noise from garbage trucks and delivery trucks), and offsite project-generated traffic.

Project Features

Prior to the demolition of the existing bus yard and maintenance and operations building, all uses would be relocated to the SFMTA's Muni Metro East Light Rail Vehicle Facility at Illinois and 25th streets and the 1399 Marin Facility at Marin and Indiana streets, or other SFMTA facilities, as described in **EIR Chapter 2, Project Description**, p. 2.23.

Proposed Construction

For purposes of the construction noise analysis, the proposed project would be constructed over a period of three years. Demolition would last about two months and site preparation, grading, and piling would last about six months. Installation of the foundation system and basement construction would last about two months. Above-ground construction (i.e., building construction, paving, and architectural coating) would take a total of about 28 months, with some work overlap (see **Table 2.2: Summary of Existing and Proposed Project Characteristics** in **EIR Chapter 2, Project Description**, p. 2.22). A list of construction equipment (e.g., impact pile driver, pavement breaker, jackhammer) expected to be used for the construction activities is shown in **EIR Appendix F-1, Noise and Vibration Assessment Methodology,** (see Appendix A of the Noise and Vibration Assessment Methodology). Nighttime

construction would be limited to major concrete pours and urgent unplanned work. If pouring concrete during nighttime is necessary, each nighttime concrete pour would not last longer than two successive nights and would require a permit.

Proposed Operation

The proposed replacement transit facility and residential component of the joint development would include emergency generators, heating/ventilation/air conditioning (HVAC) systems, and cooling towers. The analysis also evaluates the net increase in traffic from project operations.

Project Variants

The SFMTA is considering four proposed variations on features of the proposed project:

- **Emergency Exit Relocation Variant:** Relocation of the proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street.
- **Joint Development Lobby Relocation Variant:** Relocation of joint development lobby off Mariposa Street to Hampshire Street.
- **Active 17th Street Variant:** Relocation of internal bus ramps from the north to south sides to allow the mix of joint development uses along 17th Street.
- **Employee and Family Support Variant:** Site program revision to include childcare, or related use, in a portion of the space identified in the proposed project for ground-floor commercial use.

The analysis of the proposed project adequately addresses the noise and vibration impacts from the project variants because the variants are minor relocations and site programming changes which do not affect the building construction or operations. Therefore, these variants would not change the project-generated noise or vibration levels during construction or operation. See **EIR Chapter 2, Project Description**, pp. 2.56-2.58, for more detail descriptions of the project variants.

Methodology for Analysis of Noise Impacts

Table 3.D.12: Limits and Performance Standards and Qualitative Factors for Construction and Operational Noise Impact Analyses and Construction Vibration Analyses summarizes the City's construction and operational noise and vibration limits and performance standards as well as qualitative factors applied in the analysis to identify potentially significant noise and vibration impacts.

Table 3.D.12: Limits and Performance Standards and Qualitative Factors for Construction and Operational Noise Impact Analyses and Construction Vibration Analyses

NOISE AND VIBRATION LIMITS AND PERFORMANCE STANDARDS	QUALITATIVE FACTORS
Construction Noise	
Daytime Construction Noise Limits Project construction noise was evaluated at the nearest noise-sensitive receptors to determine whether the noise level resulting from the simultaneous operation of the two loudest pieces of equipment (including impact equipment) during each phase of construction would be greater than 90 dBA L_{eq} or 10 dBA above the ambient noise level (which is 67 dBA L_{eq}). Section 2907(a) of the noise ordinance limits noise from any individual piece of non-impact construction equipment to 80 dBA at 100 feet, which is equivalent to 86 dBA at 50 feet.	• severity of the exceedance at the nearest sensitive receptors • the duration of the exceedance • the affected noise sensitive receptors
Nighttime Construction Noise Limits Section 2908 of the noise ordinance prohibits nighttime construction (between 8 p.m. and 7 a.m.) that generates noise exceeding the ambient noise level by 5 dBA (which is 62 dBA L_{eq}) at the nearest property line unless a special permit has been issued. If noise levels were estimated to exceed this threshold, the potential for sleep disturbance was then evaluated based on whether nighttime construction activities would result in indoor noise levels of 45 dBA or more per the San Francisco Noise Ordinance. This assumes a typical attenuation for exterior noise inside of a building with windows closed is 25 dBA.	
Construction Truck Traffic Qualitative analysis of noise effects of construction trucks along haul routes.	
Operational Noise	
Onsite Stationary Sources The analysis evaluates noise from stationary sources relative to the allowed operational noise limit of section 2909(b) (8 dBA above ambient at the property plane of a commercial property) and section 2909(d) of the noise ordinance (i.e., interior noise limits of 45 dBA between the hours of 10 p.m. to 7 a.m. or 55 dBA between the hours of 7 a.m. to 10 p.m. at the nearest sensitive receptor, as discussed on p. 3.D.22). Existing ambient noise levels range from 52 to 57 dBA L_{90} in the vicinity of the project site.	• severity of the exceedance at the nearest noise sensitive receptors • the duration of the exceedance • the affected noise sensitive receptors
Other Onsite Sources The analysis discusses the noise effects of other onsite sources related to bus maintenance activities (i.e., repair and wash), vehicle movements, and noise from garbage trucks and delivery trucks qualitatively.	
Operational Traffic This standard, which assumes a substantial permanent increase in traffic noise levels of 3 dBA L_{dn} or more.	

NOISE AND VIBRATION LIMITS AND PERFORMANCE STANDARDS	QUALITATIVE FACTORS
Construction-Related Groundborne Vibration	
Generation of construction-related groundborne vibration levels exceeding the FTA "Occasional Events" level of 65 RMS VdB at building with vibration sensitive equipment during both daytime and nighttime construction (see **Table 3.D.8**, p. 3.D.16).	• severity of the exceedance at the nearest vibration sensitive receptors • the duration of the vibration sensitive receptors • the affected vibration sensitive receptors
Generation of construction-related groundborne vibration levels exceeding the "Occasional Events" level of 75 RMS VdB at residential buildings during nighttime construction (see **Table 3.D.8**).	
Generation of construction-related groundborne vibration levels exceeding the Caltrans damage standards at offsite structures based on building classes identified in **Table 3.D.9**, p. 3.D.18 (i.e., structural damage). Thresholds for "Historic and some old buildings" were used for nearby historic buildings and thresholds for "Older residential structures" were conservatively used for other nearby buildings.	

Methodology for Analysis of Construction Noise Impacts

Implementation of the proposed project or project variants would include the use of heavy equipment on the project site for demolition of existing structures and construction of new structures. This assessment includes an evaluation of noise generated by the construction equipment identified by the project sponsor, SFMTA, and likely to be used during project construction (see the Noise and Vibration Assessment Methodology in **EIR Appendix F-1**). Noise from construction activity typically varies depending on the type of equipment in use, how many pieces of equipment are operating at any one time, the proximity of equipment to a noise receptor location (i.e., mobile equipment can be moved around a construction site), and the duration of equipment use. In addition, some equipment, such as an excavator with a hoe ram or an impact pile driver, may generate "impulsive noise emissions" (i.e., impact noise).

Construction activities would occur intermittently on the project site over the three-year construction program and could expose noise-sensitive receptors to temporary increases in noise levels exceeding ambient levels. Project construction would also result in temporary increases in truck traffic noise along haul routes as trucks haul excavated materials away, arrive at and leave the site during concrete pours, and deliver materials to the site. Because construction noise is inherently variable, qualitative factors (e.g., duration and frequency of the noise, proximity to sensitive receptors) were also taken into consideration in the construction noise analysis for the proposed project, as applicable. Therefore, quantitative noise levels (i.e., the standards established in the local general plan or noise ordinance, or applicable standards of other agencies) are considered in combination with qualitative factors to determine the significance of project-generated noise.

Noise emitted from operation of construction equipment was estimated based on construction equipment noise data published by the United States Federal Highway Administration and the FTA.

The agencies' construction equipment sound levels assuming peak operation over a full hour are shown in **Table 3.D.13: Representative Construction Equipment Noise Levels – Peak Hourly Use**.

Table 3.D.13: Representative Construction Equipment Noise Levels – Peak Hourly Use

Equipment	Peak Hourly L_{eq} at 50 feet (dBA) [NOTE A]	Peak Hourly L_{eq} at 100 feet (dBA) [NOTE A]
Impact Equipment		
Excavators with Hoe Ram	**90**	**84**
Impact Pile Driver [NOTE B]	**101**	**95**
Non-Impact Equipment [NOTE C]		
Air Compressors	80	74
Bore/Drill Rigs	85	79
Cement and Mortar Mixers	85	79
Concrete/Industrial Saws	**90**	**84**
Cranes	85	79
Excavators	85	79
Generator Sets	82	76
Graders	85	79
Other Construction Equipment	85	79
Other General Industrial Equipment	85	79
Other Material Handling Equipment	85	79
Pavers	85	79
Paving Equipment	85	79
Plate Compactors	83	77
Pressure Washers	85	79
Pumps	81	75
Rollers	85	79
Rough Terrain Forklifts	85	79
Rubber-Tired Dozers	85	79
Rubber-Tired Loaders	80	74
Scrapers	85	79
Skid Steer Loaders	80	74
Tractors/Loaders/Backhoes	84	78
Trenchers	85	79
Welders	74	68
Slant Pile Drill	85	79
Soil Mix Drill Rig	85	79
Grout Plant	80	74
Tie Back Drill	85	79
Air Compressor for Tie Back Rig	80	74
Concrete Truck	82	76
Concrete Boom Pump	82	76
Tower Crane	85	79
Hoist (Construction Elevator)	85	79
Recycling Plant	85	79

Notes: **Boldface values** indicate an exceedance of the noise ordinance limit of 80 dBA at a distance of 100 feet, or 86 dBA at 50 feet.

[A] Based on highest anticipated noise level, assuming 100 percent use during any one-hour period.

[B] The original equipment listed is a soldier pile rig. It is assumed that impact pile driving methods will be used for pile installations. Therefore, noise emissions are assumed identical to an impact pile driver.

[C] Forklifts, signal boards, scissor lift, and light plant are not considered heavy construction equipment and therefore are not presented in the table.

Source: Federal Highway Administration, FHWA Highway Construction Noise Handbook, August 2006, Table 9.1, p. 91.

DAYTIME CONSTRUCTION

For daytime construction, the analysis evaluated temporary noise emissions from construction equipment and related noise levels at the nearest noise-sensitive receptors per the FTA's guidelines for assessing noise impact and relative to the existing noise environment. Specifically, the assessment determined if the noise level resulting from the simultaneous operation of the two loudest pieces of equipment (including impact equipment) would be greater than 90 dBA L_{eq}. The planning department also evaluates whether construction noise would result in an increase of 10 dBA over existing noise levels ("Ambient + 10 dBA") at sensitive receptors, which generally represents a perceived doubling of loudness. As discussed under "Existing Conditions," ambient noise levels range from 57 to 65 dBA L_{eq} in the vicinity of the project site. This analysis conservatively assumed ambient noise levels of 57 dBA L_{eq} in the vicinity of the project site. As a result, the daytime construction noise threshold would be greater than 90 dBA L_{eq} or 67 dBA L_{eq} at the nearest noise-sensitive receptors in combination with qualitative factors. Section 2907(a) of the San Francisco Noise Ordinance limits non-impact[36] construction equipment noise to 80 dBA at a distance of 100 feet from equipment, or an equivalent sound level at some other convenient distance (e.g., 50 feet from the source).[37] For this analysis, the noise limit was compared to the sound level of the loudest non-impact equipment assumed to operate at peak capacity over a full hour.[38]

A usage factor was applied to each piece of equipment analyzed to account for the time that the equipment would likely be in use over the specified time period. The construction equipment sound levels are shown in **Table 3.D.14: Representative Construction Equipment Noise Levels – Average Hourly Use**. Construction noise sources were grouped according to construction phase, and the maximum hourly L_{eq} was determined using the two noisiest pieces of equipment which could be operated simultaneously in any given hour. These two noise sources were added together at the same location, and the corresponding noise levels at the nearest receptors to the project site were then predicted based on quantitative calculations that considered the approximate distance between the nearest receptors and the noise sources. The assessment was completed for the nearest noise-sensitive receptors (see **Figure 3.D.1**, p. 3.D.9). The estimated noise levels at the nearest noise-sensitive receptors were based on the attenuation of noise with distance, which decrease by 6 dB for each doubling of distance from the source. The calculations did not consider the attenuation potentially provided by barriers (e.g., intervening walls, buildings, and other structures) due to variations in the height and composition of such barriers. Therefore, this analysis provided

[36] Non-impact tools are any powered construction equipment except impact tools that are designed to deliver high torque output, such as jackhammers and impact pile drivers.
[37] Equals 86 dBA at 50 feet, based on a 6-dB increase per halving of distance to "point" source of noise.
[38] As noted on p. 3.D.21, section 2907(a) exempts impact tools and equipment provided that such impact tools and equipment have intake and exhaust mufflers recommended by the manufacturer, and that pavement breakers and jackhammers are equipped with acoustically attenuating shields or shrouds recommended by the manufacturer.

conservative results by excluding the noise attenuation benefits that intervening structures may provide.

Table 3.D.14: Representative Construction Equipment Noise Levels – Average Hourly Use

Equipment [NOTE A]	**Average Hourly L_{eq} at 50 feet (dBA)** [NOTE B]
Air Compressors	76
Bore/Drill Rigs	78
Cement and Mortar Mixers	81
Concrete/Industrial Saws	83
Cranes	77
Excavators with Hoe Ram	83
Excavators	81
Generator Sets	79
Graders	81
Other Construction Equipment	82
Other General Industrial Equipment	82
Other Material Handling Equipment	82
Pavers	82
Paving Equipment	82
Plate Compactors	76
Pressure Washers	82
Pumps	78
Rollers	78
Rough Terrain Forklifts	78
Rubber-Tired Dozers	81
Rubber-Tired Loaders	76
Scrapers	81
Skid Steer Loaders	76
Tractors/Loaders/Backhoes	80
Trenchers	82
Welders	70
Slant Pile Drill	78
Soil Mix Drill Rig	78
Grout Plant	77
Impact Pile Driver [NOTE C]	94
Tie Back Drill	78
Air Compressor for Tie Back Rig	76
Concrete Truck	75
Concrete Boom Pump	75
Tower Crane	77
Hoist (Construction Elevator)	78
Recycling Plant	82

Notes:

[A] Forklifts, signal boards, scissor lift, and light plant are not considered heavy construction equipment and therefore are not presented in the table.

[B] Based on average hourly noise level, assuming typical equipment operating capacities and usage factors.

[C] The original equipment listed is a soldier pile rig**.** It is assumed that impact pile driving methods will be used for pile installations. Therefore, noise emissions are assumed identical to an impact pile driver.

Source: Federal Highway Administration, FHWA Highway Construction Noise Handbook, August 2006, Table 9.1, p. 91.

NIGHTTIME CONSTRUCTION

Nighttime construction would be limited to major concrete pours and urgent unplanned work. If pouring concrete during nighttime is necessary, each nighttime concrete pour would not last longer than two successive nights. It is also assumed that urgent unplanned work during nighttime would be completed within two weeks. Section 2908 of San Francisco Noise Ordinance prohibits nighttime construction (between 8 p.m. and 7 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless a special permit has been issued.

As discussed under "Existing Conditions" on p. 3.D.10, ambient noise levels range from 57 to 65 dBA L_{eq} in the vicinity of the project site. This analysis conservatively assumed ambient noise levels of 57 dBA L_{eq}. As a result, the nighttime construction noise threshold would be 62 dBA L_{eq}, which is 5 dBA above the ambient noise level, in combination with qualitative factors.

If noise levels were estimated to exceed this threshold, the potential for sleep disturbance was then evaluated at the nearest residential receptors based on whether nighttime construction activities would result in indoor noise levels of 45 dBA or more per the San Francisco Noise and Vibration Impact Analysis Guidelines. This assumed a typical attenuation for exterior noise inside of a building with windows closed is 25 dBA.

CONSTRUCTION TRUCK TRAFFIC

This analysis discusses the noise effects of construction trucks along haul routes qualitatively in accordance with the approved Noise and Vibration Assessment Methodology (see **EIR Appendix F-1**).

Methodology for Analysis of Operational Noise Impacts

Operational noise from the proposed project or project variants would result from onsite stationary sources, other sources associated with activities onsite (i.e., noise from bus maintenance activities, vehicle movements, garbage trucks, and delivery trucks), and offsite project-generated traffic.

ONSITE STATIONARY SOURCES

The primary onsite sources are stationary sources such as HVAC systems, cooling towers, and generators. The analysis evaluated noise from stationary sources relative to the allowed operational noise limit of section 2909(b) (8 dBA above ambient at the property plane of a commercial property) and section 2909(d) of the noise ordinance (i.e., interior noise limits of 45 dBA between the hours of 10 p.m. to 7 a.m. or 55 dBA between the hours of 7 a.m. to 10 p.m., as discussed on p. 3.D.22). The limits are based on both absolute permanent increases over existing conditions due to operation of stationary sources (section 2909 [b]) and interior sound level limits at residential

receptors (section 2909[d]). As discussed under "Existing Conditions" on p. 3.D.10, ambient noise levels range from 52 to 57 dBA L_{90} in the vicinity of the project site.

OTHER ONSITE SOURCES

Other onsite sources associated with replacement transit facility and joint development uses include bus maintenance activities (i.e., repair and wash), vehicle movements, and noise from garbage trucks and delivery trucks. This analysis discusses the noise effects of other onsite sources qualitatively, in accordance with the approved Noise and Vibration Assessment Methodology (see **EIR Appendix F-1**).

OFFSITE TRAFFIC

The traffic noise assessment evaluated traffic conditions with and without the proposed project or project variants to determine whether increases in traffic-related noise are expected to result in a significant impact. To assess traffic noise impacts from the proposed project or project variants, traffic sound levels were calculated for existing volumes and for the increased traffic volumes under existing plus project conditions. To assess cumulative traffic noise impacts in the future from the proposed project or project variants, expected growth in traffic, and cumulative projects in the vicinity, traffic sound levels were calculated from horizon year (2040) volume estimates, including project traffic volumes.

The proposed project or project variants would generate the highest trips during the PM peak hour between 4:30 PM and 5:30 PM, and therefore traffic noise levels were calculated during the PM peak hour to represent the highest traffic noise increase during project operation. Specifically, traffic noise levels in the project vicinity were calculated for 22 roadway segments using traffic data provided for the intersections closest to the project site. The selected roadway segments were considered to have the highest potential for impact from traffic generated by the proposed project or project variants. Vehicle speed was assumed to be same as the speed limits that were identified through review of readily available online street images (i.e., Google Streetview). Traffic volumes during the PM peak hour and associated traffic composition provided by the transportation consultant were used in the Federal Highway Administration Traffic Noise Model (TNM) Lookup tool, version 2.5 (TNM Lookup) to estimate traffic noise levels (see **EIR Appendices F-3** and **F-4**).

This analysis evaluated if the proposed project or project variants would result in a substantial permanent increase in traffic noise levels based on the noise criteria from Caltrans's Technical Noise Supplement: 3 dBA is perceived as barely perceptible and 5 dBA is perceived as readily perceptible.[39] The proposed

[39] Caltrans, Division of Environmental Analysis, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, pp. 2-43 to 2-46 and Table 2-10, *https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf*, accessed November 24, 2020.

project and each of the project variants, except the Employee and Family Support Variant, would generate 226 net-new PM peak hour vehicle trips. Under the Employee and Family Support Variant 278 net-new PM peak hour vehicle trips would be generated (an increase of 54 net-new PM peak hour vehicle trips over the proposed project and other project variants). This incremental change would not generate a noticeable variance from the findings for the proposed project; thus, the operational noise analysis for the proposed project would be applicable to all project variants.

As discussed under "Existing Conditions" on p. 3.D.10, ambient noise levels range from 69 to 72 dBA L_{dn} in the vicinity of the project site. Because adjacent receptors include residences and schools, ambient noise levels ranging from 69 to 72 dBA L_{dn} exceed the maximum "satisfactory, with no special insulation requirements" exterior noise level of 60 dBA (L_{dn}) for residential uses and 65 dBA (L_{dn}) for school classrooms (see **Table 3.D.11**, p. 3.D.20). Because the existing noise environment is already degraded (i.e., exceeds the maximum "satisfactory" category), a lower standard is necessary to ensure that there would not be a significant increase in ambient noise levels. Therefore, a significant impact would be identified if the proposed project or project variants would increase the traffic noise levels by 3 dBA L_{dn} or more.

Methodology for Analysis of Vibration Impacts

The following summarizes the methodology applied in this assessment to evaluate vibration-related impacts due to construction of the proposed project or project variants.

Most traffic anticipated during operation of the proposed project or project variants would be rubber-tired and operating on pavement that is in good condition. No major sources of vibration are anticipated within the new structure. Therefore, operation of the proposed project or project variants is not anticipated to generate perceptible levels of vibration at offsite receptors. For these reasons, operational vibration is not considered further.

Methodology for Analysis of Construction Vibration Impacts

Project-related construction vibration was evaluated relative to the limits identified in the FTA's guidelines for assessing vibration disturbance to people for nighttime construction (because this is when construction could cause sleep disturbance) or interference with vibration-sensitive equipment,[40] and relative to the limits identified in the Caltrans guidelines for assessing vibration damage to buildings. Vibration levels for typical construction equipment are shown in **Table 3.D.15: Vibration Source Levels for Construction Equipment**.

[40] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

Table 3.D.15: Vibration Source Levels for Construction Equipment

Equipment	PPV_{ref} at 25 ft (in/sec) [NOTE A]	RMS_{ref} at 25 ft (in/sec) [NOTE B]
Impact Pile Driver (typical)	0.644	104
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Notes:
[A] PPV_{ref} – reference Peak Particle Velocity. PPV is appropriate for evaluating potential damage to buildings.
[B] RMS_{ref} – reference Root Mean Square. RMS is appropriate for evaluating response of the human body to vibration.
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.

The assessment of construction vibration impacts used the following assumption:

- The vibration level at people or vibration-sensitive equipment is equal to RMS_{ref} - 30×Log10(D/25) where RMS_{ref} is the reference vibration level identified in **Table 3.D.14**, and D is the distance from the equipment to the receptor.
- The vibration level at a nearby building is equal to $PPV_{ref} \times (25/D)^{1.5}$ where PPV_{ref} is the reference vibration level identified in **Table 3.D.14**, and D is the distance from the equipment to the receptor.

FTA recommends that disturbance and damage potential for each piece of equipment be assessed individually. For each piece of equipment, this analysis calculated the buffer distances at which vibration levels would be reduced below the disturbance threshold for sensitive receptors (based on the Indoor FTA Groundborne Vibration Impact Criteria in **Table 3.D.8**, p. 3.D.16) and below the damage thresholds for structures (based on the Caltrans Vibration Guidelines for Potential Damage to Structures in **Table 3.D.9**, p. 3.D.18). This analysis then evaluated whether vibration-sensitive receptors would be located within the buffer distances.

IMPACT EVALUATION

Construction Noise Impacts

Impact NO-1: Construction of the proposed project or project variants would generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the San Francisco Noise Ordinance or applicable standards of other agencies. (*Less than Significant with Mitigation)*

Daytime Construction Noise

The noise limit for non-impact construction equipment, as summarized in section 2907(a) of the noise ordinance, is 80 dBA when measured at a distance of 100 feet from the source, which equates

to 86 dBA at 50 feet.[41] To assess compliance with section 2907, noise levels from construction equipment were calculated at a distance of 100 feet from the location of individual operating pieces of equipment. As indicated, impact equipment (e.g., pile drivers, hoe rams, jackhammers, etc.) was not considered in this assessment, per the conditional exemption provided in section 2907(b).

Noise levels used for this evaluation of potential noise levels during construction were based on the highest (i.e., peak) L_{eq} noise levels during any one hour, assuming continuous equipment operation.

As shown in **Table 3.D.14**, p. 3.D.30, the estimated noise levels for all non-impact construction equipment (except for concrete/industrial saws) are expected to be less than 80 dBA at 100 feet (or 86 dBA at 50 feet) and would comply with the limits in section 2907(a) of the noise ordinance. However, a concrete/industrial saw could reach 84 dBA at 100 feet (90 dBA at 50 feet), which exceeds the noise ordinance standard. A concrete/industrial saw would be used for relatively detailed demolition work, such as removing or opening up a specific area of roadway or sidewalk. As such, the duration and frequency of their use would not be extensive (typically less than a few hours at a time) and would occur during normal daytime construction hours. For these reasons, if a concrete/industrial saw would be necessary to complete construction, there would be temporary exceedance of the noise standards in section 2907(a).

Offsite noise-sensitive receptors around the perimeter of the project site are listed in **Table 3.D.4**, p. 3.D.11, and shown in **Figure 3.D.1**, p. 3.D.9. Estimated construction noise levels from the two noisiest pieces of construction equipment at the nearest noise-sensitive receptors for each phase of construction are presented in **Table 3.D.16: Estimated Daytime Construction Noise Levels at Offsite Receptors**. As shown in **Table 3.D.16**, construction noise levels would exceed the daytime noise threshold of "10 dBA L_{eq} above the ambient noise level" at all the nearest noise-sensitive receptors during all phases of construction. Specifically, construction noise would exceed the noise threshold of "10 dBA L_{eq} above the ambient noise level" by a range of 2 to 23 dBA. The highest exceedance of 23 dBA would occur when an impact pile driver and any other piece of equipment is used during site preparation, grading, and piling at the nearest noise-sensitive receptor (1800 Bryant Street).[42]

[41] Based on a standard noise level increase from a point source of 6 dBA per halving of distance to the stationary noise source.

[42] An impact pile driver would generate at least 10 dBA higher than any other piece of equipment at 1800 Bryant Street. When the difference between two sources of noise is 10 dBA or more, the higher noise source dominates, and the lower noise source makes no perceptible difference in what can be heard or measured. Therefore, the combined noise level from an impact pile driver and any other piece of equipment would be the same as the noise level from an impact pile driver.

Table 3.D.16: Estimated Daytime Construction Noise Levels at Offsite Receptors

Receptor NOTE A	Primary Use (Location)	Construction Phase	Noise from Two Noisiest Pieces of Equipment (dBA L_{eq}) NOTE B, NOTE C	Does Noise Level Exceed Daytime Noise Threshold of 67 dBA Leq (10 dBA Leq above the ambient noise level)?	Does Noise Level Exceed 90 dBA L_{eq} Noise Threshold?
R1	Residential (2501 Mariposa Street)	Demolition	84	**Yes**	No
		Site Preparation, Grading, and Piling	85	**Yes**	No
		Foundation	84	**Yes**	No
		Building Construction	83	**Yes**	No
		Paving	83	**Yes**	No
		Architectural Coating	82	**Yes**	No
R2	Residential (475 Hampshire Street)	Demolition	82	**Yes**	No
		Site Preparation, Grading, and Piling	82	**Yes**	No
		Foundation	82	**Yes**	No
		Building Construction	81	**Yes**	No
		Paving	81	**Yes**	No
		Architectural Coating	80	**Yes**	No
R3	Residential (1800 Bryant Street)	Demolition	82	**Yes**	No
		Site Preparation, Grading, and Piling	90	**Yes**	No
		Foundation	82	**Yes**	No
		Building Construction	81	**Yes**	No
		Paving	81	**Yes**	No
		Architectural Coating	80	**Yes**	No
R4	Residential (1900 Bryant Street)	Demolition	80	**Yes**	No
		Site Preparation, Grading, and Piling	88	**Yes**	No
		Foundation	80	**Yes**	No
		Building Construction	79	**Yes**	No
		Paving	79	**Yes**	No
		Architectural Coating	78	**Yes**	No

Receptor NOTE A	Primary Use (Location)	Construction Phase	Noise from Two Noisiest Pieces of Equipment (dBA L_{eq}) NOTE B, NOTE C	Does Noise Level Exceed Daytime Noise Threshold of 67 dBA Leq (10 dBA Leq above the ambient noise level)?	Does Noise Level Exceed 90 dBA L_{eq} Noise Threshold?
R5	Residential (2445 Mariposa Street)	Demolition	80	**Yes**	No
		Site Preparation, Grading, and Piling	80	**Yes**	No
		Foundation	80	**Yes**	No
		Building Construction	79	**Yes**	No
		Paving	79	**Yes**	No
		Architectural Coating	78	**Yes**	No
R6	Residential (480 Potrero Avenue)	Demolition	75	**Yes**	No
		Site Preparation, Grading, and Piling	77	**Yes**	No
		Foundation	75	**Yes**	No
		Building Construction	74	**Yes**	No
		Paving	74	**Yes**	No
		Architectural Coating	73	**Yes**	No
R7	Residential (1746-1712 Bryant Street, 2401 16th Street)	Demolition	74	**Yes**	No
		Site Preparation, Grading, and Piling	82	**Yes**	No
		Foundation	74	**Yes**	No
		Building Construction	73	**Yes**	No
		Paving	73	**Yes**	No
		Architectural Coating	72	**Yes**	No
R8	Residential (2726 17th Street)	Demolition	73	**Yes**	No
		Site Preparation, Grading, and Piling	81	**Yes**	No
		Foundation	73	**Yes**	No
		Building Construction	72	**Yes**	No
		Paving	72	**Yes**	No
		Architectural Coating	71	**Yes**	No

(Table 3.D.16 continued)

Receptor NOTE A	Primary Use (Location)	Construction Phase	Noise from Two Noisiest Pieces of Equipment (dBA L_{eq}) NOTE B, NOTE C	Does Noise Level Exceed Daytime Noise Threshold of 67 dBA Leq (10 dBA Leq above the ambient noise level)?	Does Noise Level Exceed 90 dBA L_{eq} Noise Threshold?
R9	Preschool (2730 17th Street)	Demolition	72	**Yes**	No
		Site Preparation, Grading, and Piling	80	**Yes**	No
		Foundation	72	**Yes**	No
		Building Construction	71	**Yes**	No
		Paving	71	**Yes**	No
		Architectural Coating	70	**Yes**	No
R10	Preschool (1960 Bryant Street)	Demolition	71	**Yes**	No
		Site Preparation, Grading, and Piling	79	**Yes**	No
		Foundation	71	**Yes**	No
		Building Construction	70	**Yes**	No
		Paving	70	**Yes**	No
		Architectural Coating	69	**Yes**	No

Notes: **Boldface** values indicate an exceedance of the significance threshold criterion.

[A] Receptor locations are shown on **Figure 3.D.1**, p. 3.D.9.

[B] The two noisiest pieces of equipment for each construction phase are as follows: a concrete/industrial saw and one of the other construction equipment or recycling plant during demolition; two excavators with hoe ram at R1 and R2, and an impact pile driver and any other piece of equipment at all the other receptors during site preparation, grading, and piling; a concrete/industrial saw and one of the other construction equipment, other general industrial equipment, or other material handling equipment during foundation; two of the other construction equipment, other material handling equipment, or pressure washer during building construction; two of the other material handling equipment, pavers, or paving equipment during paving; one pressure washer and one hoist during architectural coating.

[C] According to the geotechnical engineering report prepared for this project, excavators with hoe ram would likely be used in the eastern portion of the project site to break up bedrock, and an impact pile driver would likely be used in the western portion of the project site to provide the necessary support for the foundation.

Source: Baseline, 2020. ARUP/RYCG, SFMTA Potrero Facility Rebuild Geotechnical Engineering Report. November 11, 2019.

As shown in **Table 3.D.16**, construction noise levels would not exceed the 90 dBA L_{eq} threshold at any of the nearest noise-sensitive receptors during any of the phases of construction. However, construction noise levels would exceed the daytime noise threshold of "10 dBA L_{eq} above the ambient noise level."

Nighttime Construction Noise

Major concrete pours could occur during nighttime and could involve the use of concrete pump trucks, concrete mixer trucks, and cranes, which could generate noise levels of 75 dBA L_{eq}, 81 dBA L_{eq}, and 77 dBA L_{eq} at 50 feet, respectively (see **Table 3.D.14**, p. 3.D.30).[43] The two noisiest pieces of equipment (assuming two concrete mixer trucks) could generate noise levels of 84 dBA L_{eq}. Such noise levels would exceed the nighttime construction noise limits of 62 dBA L_{eq} (5 dBA above the ambient noise level) at project boundaries (as specified in section 2908 of the noise ordinance) when equipment is operated near the project site boundaries. As indicated in section 2908 of the noise ordinance, a nighttime permit is required if any activity is anticipated outside of work hours and has the potential to exceed nighttime construction noise limits. **Table 3.D.17: Estimated Nighttime Construction Noise Levels at Residential Receptors** presents the estimated interior noise levels during construction from the two noisiest pieces of construction equipment at the nearest residential receptors. As shown in **Table 3.D.17**, noise levels could exceed the nighttime interior noise threshold at all nearby residential receptors.

Offsite Haul Traffic

During construction, secondary sources of noise would include trucks hauling materials to and from the project site. It is anticipated that the proposed project's or project variants' construction-related truck trips would travel on City-designated truck routes to minimize impacts related to construction traffic such as the U.S. 101 and I-280 highways and surface streets including 16th Street, portions of 17th Street, Bryant Street, and Mariposa Street.[44] Therefore, noise associated with truck traffic would not increase ambient noise substantially. In addition, construction duration would not exceed five years and therefore this activity would be limited in duration.

As discussed above, construction noise levels would: 1) temporarily exceed the standards in section 2907(a) of the noise ordinance; 2) exceed the daytime noise threshold of "10 dBA L_{eq} above the ambient noise level"; and 3) exceed the nighttime interior noise threshold of 45 dBA L_{eq} at all nearby residential receptors.

[43] Noise levels generated from construction mixer trucks are estimated to be similar to cement and mortar mixers.

[44] Construction trucks would follow the routes identified in the Vehicles and Parking – Truck Routes section of the SF Transportation Information Map*, https://sfplanninggis.org/TIM/*, accessed May 5, 2021.

Table 3.D.17: Estimated Nighttime Construction Noise Levels at Residential Receptors

Receptor [NOTE A]	Location	Construction Phase	Noise from Two Noisiest Pieces of Equipment (dBA L_{eq}) [NOTE B]	Estimated Interior Noise (dBA L_{eq})	Does Noise Level Exceed Nighttime Interior Noise Threshold of 45 dBA L_{eq}?
R1	2501 Mariposa Street	Nighttime	82	57	**Yes**
R2	475 Hampshire Street	Nighttime	80	55	**Yes**
R3	1800 Bryant Street	Nighttime	80	55	**Yes**
R4	1900 Bryant	Nighttime	78	53	**Yes**
R5	2445 Mariposa Street	Nighttime	78	53	**Yes**
R6	480 Potrero Avenue	Nighttime	73	48	**Yes**
R7	1746-1712 Bryant Street, 2401 16th Street	Nighttime	72	47	**Yes**
R8	2726 17th Street	Nighttime	71	46	**Yes**

Notes: **Boldface** values indicate an exceedance of the significance threshold criterion.

[A] Receptor locations are shown on **Figure 3.D.1**, p. 3.D.9.

[B] The two noisiest pieces of equipment are two concrete mixer trucks.

Source: Baseline, 2020.

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Mitigation Measure M-NO-1: Construction Noise Control, described below, requires implementation of noise control measures in accordance with a noise control plan approved by the planning department during all construction activities.

Mitigation Measure M-NO-1: Construction Noise Control

The SFMTA and a private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall prepare construction noise control documentation as detailed below.

Prior to issuance of any demolition or building permit, the project sponsor team shall submit a project-specific construction noise control plan to the Environmental Review Officer (ERO) or the ERO's designee for approval. The construction noise control plan shall be prepared by a qualified acoustical engineer, with input from the construction contractor, and include all feasible measures to reduce construction noise. The construction noise control plan shall identify noise control measures to meet a performance target of construction activities not resulting in a noise level greater than 90 dBA at noise-sensitive receptors and 10 dBA above the ambient noise level at noise-sensitive receptors. The project sponsor team shall ensure that requirements of the construction noise control plan are included in contract specifications. If nighttime construction is required, the plan shall include specific measures to reduce nighttime construction noise. The plan shall also include measures for notifying the public of construction activities, complaint procedures, and a plan for monitoring construction noise levels in the event complaints are received. The construction noise control plan shall include the following measures to the degree feasible, or other effective measures, to reduce construction noise levels:

- Use construction equipment that is in good working order, and inspect mufflers for proper functionality;
- Select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures);
- Use construction equipment with lower noise emission ratings whenever possible, particularly for air compressors;
- Prohibit the idling of inactive construction equipment for more than five minutes;
- Locate stationary noise sources (such as compressors) as far from nearby noise-sensitive receptors as possible, muffle such noise sources, and construct barriers around such sources and/or the construction site;
- Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (as determined by the acoustical engineer) immediately adjacent to neighbors;
- Enclose or shield stationary noise sources from neighboring noise-sensitive properties with noise barriers to the extent feasible. To further reduce noise, locate stationary equipment in pit areas or excavated areas, if feasible; and
- Install temporary barriers, barrier-backed sound curtains and/or acoustical panels around working powered impact equipment and, if necessary, around the project site perimeter. When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of

the barrier panels and the ground, shall be closed with material that completely closes the gaps, and dense enough to attenuate noise.

The construction noise control plan shall include the following measures for notifying the public of construction activities, complaint procedures, and monitoring construction noise levels:

- Designate an on-site construction noise manager for the project;
- Notify neighboring noise-sensitive receptors within 300 feet of the project construction area at least 30 days in advance of high-intensity noise-generating activities (e.g., pier drilling, pile driving, and other activities that may generate noise levels greater than 90 dBA at noise-sensitive receptors) about the estimated duration of the activity;
- Post a sign onsite describing noise complaint procedures and a complaint hotline number that shall always be answered during construction;
- Implement a procedure for notifying the planning department of any noise complaints within one week of receiving a complaint;
- Establish a list of measures for responding to and tracking complaints pertaining to construction noise. Such measures may include the evaluation and implementation of additional noise controls at sensitive receptors (residences, hospitals, convalescent homes, schools, churches, hotels and motels, and sensitive wildlife habitat); and
- Conduct noise monitoring (measurements) at the beginning of major construction phases (e.g., demolition, grading, excavation) and during high-intensity construction activities to determine the effectiveness of noise attenuation measures and, if necessary, implement additional noise control measures.

The construction noise control plan shall include the following additional measures in the event of pile-driving activities:

- When pile driving is to occur within 600 feet of a noise-sensitive receptor, implement "quiet" pile-driving technology (such as pre-drilling of piles, sonic pile drivers, auger cast-in-place, or drilled-displacement, or the use of more than one pile driver to shorten the total pile-driving duration [only if such measure is preferable to reduce impacts to sensitive receptors]) where feasible, in consideration of geotechnical and structural requirements and conditions;
- Where the use of driven impact piles cannot be avoided, properly fit impact pile driving equipment with an intake and exhaust muffler and a sound-attenuating shroud, as specified by the manufacturer; and
- Conduct noise monitoring (measurements) before, during, and after the pile-driving activity.

For daytime construction, construction would comply with public works' **SCM #5, Noise**, which require measures to minimize noise disruption to nearby neighbors and sensitive receptors during construction. Implementation of **Mitigation Measure M-NO-1** would reduce construction noise impacts from the proposed project or project variants by requiring the project sponsor team to develop and implement a list of feasible noise control measures to be employed during construction, considering site constraints. The construction noise control plan shall be developed with a

performance target of reducing construction noise levels to below 90 dBA and 10 dBA above ambient noise levels at sensitive receptor locations. The construction noise control plan must be reviewed and approved by the planning department. Measures in the construction noise control plan would directly lessen construction noise through various methods including, but not limited to, the following: (1) place a barrier (or barriers) between the sensitive receptor(s) and the noise source; (2) ensure that equipment (and trucks) used for project construction use the best available noise control techniques (e.g., improved mufflers, equipment redesign, intake silencers, ducts, engine enclosures, acoustically attenuating shields or shrouds); and (3) operate noisy equipment as far as possible from sensitive receptors. Additional measures include requirements to identify a construction noise manager, track and respond to complaints, and noise monitoring at the beginning of major construction phases. These measures would serve to lessen construction noise increases at sensitive receptor locations.

As discussed above, the highest exceedance of 23 dBA would occur when an impact pile driver and any other piece of equipment are used during site preparation, grading, and piling at the nearest noise-sensitive receptor (1800 Bryant Street). The implementation of **Mitigation Measure M-NO-1** requires the implementation of "quiet" pile-driving technology (such as pre-drilling of piles, sonic pile drivers, auger cast-in-place, or drilled-displacement, or the use of more than one pile driver to shorten the total pile-driving duration [only if such measure is preferable to reduce impacts to sensitive receptors]) where feasible. As discussed in the geotechnical engineering report prepared for this project,[45] alternative options could involve auger-cast-in-place piles or torque-down piles, which would generate much lower noise levels. If impact pile driving is unavoidable, **Mitigation Measure M-NO-1** requires fitting impact pile driving equipment with an intake and exhaust muffler and a sound-attenuating shroud, as specified by the manufacturer. **Mitigation Measure M-NO-1** also requires noise monitoring before, during, and after the pile driving activity. Although it is possible that despite application of this standard requirement, construction activities may result in noise levels of 90 dBA at noise-sensitive receptors, or increase noise levels by 10 dBA above ambient levels at noise-sensitive receptors, with application of **Mitigation Measure M-NO-1**, the expected frequency, duration, and intensity of construction noise above these levels would be substantially reduced. Specifically, installation of the foundation system would last about two months and therefore the exceedance of the daytime noise threshold would be temporary.

Nighttime construction would be limited to major concrete pours and urgent unplanned work. If pouring concrete during nighttime is necessary, a nighttime permit would be required, and each nighttime concrete pour would not last longer than two successive nights. Urgent unplanned work during nighttime would also be completed within two weeks. Construction contractors would comply with public works' **SCM #5, Noise**, for nighttime construction activities, which requires using intake exhaust mufflers and/or acoustically attenuating shields or shrouds on impact tools,

[45] ARUP/RYCG, SFMTA Potrero Facility Rebuild Geotechnical Engineering Report, November 11, 2019.

avoiding the use of water blasters, reducing the use of backup warning alarms to the extent feasible, and implementing administrative controls for worker protection from backing movements by vehicles. Implementation of **Mitigation Measure M-NO-1** would require specific measures included in the construction noise control plan to reduce nighttime construction noise. Given the limited duration of exceedance, the potential impact related to noise from nighttime construction work would be less than significant.

Because **Mitigation Measure M-NO-1** would reduce the proposed project's or project variants' temporary increases in ambient noise levels from construction to the maximum extent feasible and because the exceedance of both daytime and nighttime construction thresholds would be limited in time, the potential for construction of the proposed project or project variants to generate a substantial temporary increase in noise, as described above, would be less than significant.

Construction Vibration Impacts

Impact NO-2: Construction of the proposed project or project variants would generate excessive groundborne vibration or groundborne noise levels. (*Less than Significant with Mitigation)*

Generation of Excessive Groundborne Noise

Vibration in buildings caused by construction activities may be perceived as motion of building surfaces or rattling of windows, items on shelves, and pictures hanging on walls. Vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range of vibration frequencies (i.e., 60 to 200 Hertz), when the structure and the construction activity are connected by foundations or utilities, such as sewer and water pipes, or when the airborne noise path is blocked, such as during tunneling activities. Construction activities related to the proposed project or project variants, including excavation activities where the highest levels of vibration are anticipated, would not include vibration of foundations or utilities that are connected to existing structures, and would not include tunneling operations. Therefore, impacts due to groundborne noise would be less than significant.

Table 3.D.18: Building Damage and Vibration Disturbance Buffer Distances presents the buffer distances at which vibration levels would be reduced below the disturbance threshold for sensitive receptors and below the damage thresholds for structures.

Table 3.D.28: Building Damage and Vibration Disturbance Buffer Distances

Vibration-Generating Equipment	Peak Particle Velocity at 25 feet	Root Mean Square at 25 Feet	Source Character	Buffer Distance in Feet (Distance Beyond Which Effect Not Expected)			
				Historic and Some Old Buildings Damage Thresholds (0.25 in/sec PPV for Continuous/Frequent Intermittent sources; 0.5 in/sec PPV for transient sources) NOTE A	Older Residential Structures Damage Thresholds (0.3 in/sec PPV for Continuous/Frequent Intermittent sources; 0.5 in/sec PPV for Transient sources) NOTE B	Disturbance Threshold of 75-RMS VdB for Residential Buildings During Nighttime Construction	Disturbance Threshold of 65-RMS VdB for KQED Building During Both Daytime and Nighttime Construction NOTE C
Impact Pile Driver (typical)	0.644	104	Continuous/Frequent Intermittent Sources	47	42	--	232
Vibratory Roller	0.21	94	Continuous/Frequent Intermittent Sources	22	20	--	107
Hoe Ram	0.089	87	Continuous/Frequent Intermittent Sources	13	11	--	63
Caisson Drilling	0.089	87	Continuous/Frequent Intermittent Sources	13	11	--	63
Large Bulldozer	0.089	87	Transient Sources	8	8	--	63
Loaded Trucks	0.076	86	Transient Sources	7	7	58	58
Jackhammer	0.035	79	Transient Sources	4	4	--	34
Small Bulldozer	0.003	58	Transient Sources	1	1	--	7

Notes: -- Not calculated because they are not anticipated to be used during nighttime construction.

[A] Historic resources in the vicinity of the project site are the Verdi Club at 2424 Mariposa Street (130 feet to the east of the project site), the SGI Cultural Center at 2450 17th Street (110 feet to the northeast of the project site), and the Leyser-Green Co. Building at 2401-2425 17th Street (80 feet to the east of the project site).

[B] Thresholds for "Older residential structures" were conservatively used for other nearby buildings.

[C] After consideration of 10 VdB of vibration attenuation due to ground-to-building vibration coupling loss.

Source: Baseline, 2020.

All of the historic buildings surrounding the project site would be located outside of the 47-foot buffer and all the other buildings would be located outside of the 42-foot buffer where vibration damage could occur (see **Tables 3.D.4** and **3.D.5**, pp. 3.D.11-3-D.12). Therefore, impacts related to vibration damage to historic buildings in the vicinity of the project site would be less than significant.

Nighttime construction would be limited to major concrete pours and urgent unplanned work (e.g., installation of electrical and security components). It is anticipated that loaded trucks could be used during nighttime construction. Based on the vibration disturbance buffer distance information shown in **Table 3.D.17**, p. 3.D.40, residential receptors located at 2501 Mariposa Street could be exposed to vibration in excess of the disturbance threshold, indicating that nighttime construction could annoy these residential receptors temporarily. No other residential receptors would be exposed to vibration in excess of the threshold. Each nighttime concrete pour would not last longer than two successive nights and any urgent unplanned work during nighttime would also be completed within two weeks. Given the limited duration of exceedances, the potential impact on residential receptors from vibration disturbance during nighttime would be less than significant.

As indicated in **Table 3.D.17**, the use of an impact pile driver or a vibratory roller could interfere with vibration-sensitive equipment located at the KQED building at 2601 Mariposa Street if this construction equipment is operated within the vibration disturbance buffer distance, as shown in **Table 3.D.17**.

Public works' **SCM #9, Cultural Resources**, does not provide a specific performance threshold to limit vibration-intensive activities or equipment for vibration sensitive equipment. It is possible that construction activities conducted within the vibration disturbance buffer distance as shown in **Table 3.D.17** could generate levels of vibration that would result in interference with nearby vibration-sensitive equipment and the impact would be significant.

Mitigation Measure M-NO-2: Vibration-Sensitive Equipment at 2601 Mariposa Street (KQED) Building, described below, would reduce the potential to interfere with vibration-sensitive equipment as a result of project construction by verifying the locations of vibration-sensitive equipment (if any) and requiring the appropriate outreach prior to the planned construction activities.

> **Mitigation Measure M-NO-2: Vibration-Sensitive Equipment at 2601 Mariposa Street (KQED) Building**
>
> Prior to construction, the SFMTA and a private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall designate and make available a community liaison to respond to vibration complaints from building occupants at the KQED building located at 2601 Mariposa Street.

Contact information for the community liaison shall be posted in a conspicuous location so that it is clearly visible to building occupants most likely to be disturbed. Through the community liaison, the project sponsor team shall provide notification to property owners and occupants of 2601 Mariposa Street at least 10 days prior to construction activities involving equipment that can generate vibration capable of interfering with vibration-sensitive equipment, informing them of the estimated start date and duration of vibration-generating construction activities. Equipment types capable of generating such vibration include an impact pile driver, or similar equipment, operating within 250 feet of the building or a vibratory roller, or similar equipment, operating within 125 feet of the building. If feasible, the project sponsor team shall identify potential alternative equipment and techniques that could reduce construction vibration levels. Alternative equipment and techniques may include, but are not limited to:

- pre-drilled piles,
- caisson drilling,
- oscillating or rotating pile installation,
- jetting piles into place using a water injection at the tip of the pile could be substituted for driven piles, if feasible, based on soil conditions
- static rollers could be substituted for vibratory rollers in some cases.

If concerns prior to construction or complaints during construction related to equipment interference are identified, the community liaison shall work with the project sponsor team and the affected building occupants to resolve the concerns such that the vibration control measures would meet a performance target of the 65 VdB vibration level threshold for vibration sensitive equipment, as set forth by Federal Transit Authority (FTA). To resolve concerns raised by building occupants, the community liaison shall convey the details of the complaint(s) to the project sponsor team, such as who shall implement specific measures to ensure that the project construction meets the performance target of 65 VdB vibration level for vibration sensitive equipment. These measures may include evaluation by a qualified noise and vibration consultant, scheduling certain construction activities outside the hours of operation or recording periods of specific vibration-sensitive equipment if feasible, and/or conducting ground-borne vibration monitoring to document that the project can meet the performance target of 65 VdB at specific distances and/or locations. Ground-borne vibration monitoring, if appropriate to resolve concerns, shall be conducted by a qualified noise and vibration consultant.

With the implementation of **Mitigation Measure M-NO-2**, construction equipment would not generate vibration exceeding the 65 VdB impact level. Therefore, potential vibration impacts on vibration-sensitive equipment at the KQED building as a result of project construction would be reduced to a less-than-significant level.

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Operational Noise Impacts

Impact NO-3: Operation of the proposed project or project variants would generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan, or applicable standards of other agencies. (*Less than Significant with Mitigation*)

Onsite Stationary Sources

The proposed project and project variants could involve the installation of emergency generators, HVAC systems, and cooling towers.

The proposed project or project variants would include operation of three emergency diesel generators: two dedicated for the backup power requirements of the replacement transit facility and one dedicated for the proposed residential development. The locations of the generators have not yet been determined; however; reasonable locations for the emergency generators include the proposed basement level and the rooftop of the east-west portion of the residential development along Mariposa Street (see **Figures 2.12** and **2.19**, p. 2.36 and 2.43, respectively). The new emergency generators would be completely shielded from existing noise-sensitive receptors. The exhaust for the generator would be vented to the roof of the building. Therefore, noise impacts during routine testing of the generators (i.e., approximately 50 hours each over the course of a year) would be expected to be less than significant.

Information regarding the noise-generating characteristics and locations of HVAC systems and cooling towers was not available at the time when this analysis was conducted. Noise from typical commercial-scale HVAC system units can range from approximately 65 to 75 dBA at 50 feet, whereas noise from cooling towers can range from approximately 70 to 85 dBA at 50 feet.[46] Due to the low existing ambient noise levels ranging from 52 to 57 dBA L_{90}, and the early phases of project design, onsite stationary sources without proper noise attenuation could have the potential to exceed operational noise limits in the noise ordinance.

Mitigation Measure M-NO-3: Fixed Mechanical Equipment Noise Control for Building Operations, described below, would reduce the potential noise increase during operation.

> **Mitigation Measure M-NO-3: Fixed Mechanical Equipment Noise Control for Building Operations**
>
> The SFMTA and a private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall prepare operational noise control documentation as detailed below.
>
> Prior to approval of a building permit, the project sponsor team shall submit documentation to the Environmental Review Officer (ERO) or the officer's designee, demonstrating with

[46] San Francisco Planning Department, 3333 California Street Mixed-Use Project Final EIR, September 5, 2019, Case No. 2015-014028ENV.

reasonable certainty that the building's fixed mechanical equipment (such as heating, ventilation and air conditioning [HVAC] equipment) meets the noise limits specified in sections 2909 (b) and 2909 (d) of the noise ordinance (i.e., an 8-dB increase above the ambient noise level at the property plane for commercial or mixed-use properties; and interior noise limits of 55 dBA and 45 dBA for daytime and nighttime hours inside any sleeping or living room in a nearby dwelling unit on a residential property assuming windows open, respectively). Acoustical treatments required to meet the noise ordinance may include, but are not limited to:

- Enclosing noise-generating mechanical equipment;
- Installing relatively quiet models of air handlers, exhaust fans, and other mechanical equipment;
- Using mufflers or silencers on equipment exhaust fans;
- Orienting or shielding equipment to protect noise-sensitive receptors (residences, hospitals, convalescent homes, schools, churches, hotels and motels, and sensitive wildlife habitat) to the greatest extent feasible;
- Increasing the distance between noise-generating equipment and noise-sensitive receptors; and/or
- Placing barriers around the equipment to facilitate the attenuation of noise.

Compliance with this fixed-mechanical equipment noise control for building operations standard requirement does not obviate the need for the equipment to demonstrate compliance with the noise ordinance throughout the lifetime of the project.

Compliance with **Mitigation Measure M-NO-3** would ensure that the proposed project's or project variants' fixed mechanical equipment is designed to comply with applicable requirements of the noise ordinance prior to issuance of a building permit. Compliance with this standard requirement would reduce the potential for fixed mechanical systems to be installed that do not comply with the noise ordinance and then after installation become the subject of enforcement action. Specifically, compliance with the property plane noise limits in the noise ordinance would ensure that noise from fixed mechanical equipment does not significantly increase ambient noise levels. Compliance with the interior noise standards of the noise ordinance would ensure that noise from fixed mechanical equipment does not result in a significant noise impact to sensitive receptors. The noise ordinance standards for fixed mechanical equipment were developed with the intention of preventing unwanted, excessive, and avoidable noise. With implementation of **Mitigation Measure M-NO-3**, the proposed project or project variants would comply with noise ordinance standards. Therefore, the impact would be reduced to a less-than-significant level.

Other Onsite Sources

Other onsite sources are related to bus maintenance activities (i.e., repair and wash), vehicle movements, and noise from garbage trucks and delivery trucks.

Under the existing conditions, the western half of the project site has an outdoor bus storage yard, a running repair station and bus wash operations along the north and west edges, and a vacuum and

fare collection station on the open portion of site near the maintenance and operations building. The proposed project or project variants would involve a replacement transit facility and introduce new residential and commercial uses to the site. Therefore, the proposed project or project variants could increase onsite activities related to bus maintenance activities and vehicle movements. However, the proposed project or project variants would not have an outdoor bus storage yard, which are the existing conditions on the site. Bus maintenance activities and most vehicle movements (except when the facility doors need to be open for vehicles entering or exiting the facility) would occur in an enclosed space. Therefore, it is anticipated that the proposed project or project variants would not substantially increase the noise levels received at nearby receptors above existing ambient noise levels.

As discussed under section 2904 of the police code, p. 3.D.22, noise emissions from the mechanical processing systems of waste collection vehicles are limited to a sound level limit of 75 dBA at a distance of 50 feet. Most onsite garbage collection activity would occur within the proposed basement level (see **Figure 2.12: Proposed Basement Level Plan**, p. 2.36); therefore, noise from waste collection within the basement would be shielded by intervening walls. Offsite garbage collection along Bryant Street for the proposed commercial use would emit noise that would be similar in character and scheduled frequency to existing garbage collection along this roadway.

Noise emissions from delivery trucks would occur only for relatively short periods of time and would not be expected to occur frequently. In addition, the noise generated by delivery trucks at the project site would be consistent with existing noise sources and land uses surrounding the project site because the project site is in a mixed-use urban area.

Therefore, noise from these activities would not result in significant impacts, and mitigation is not necessary.

Offsite Traffic

The assessment of traffic volumes along 22 roadway segments during the PM peak hour indicates the highest traffic volume increase of 39 percent would occur along the roadway segment of Mariposa Street between Hampshire Street and Potrero Avenue (from 274 trips to 380 trips). The estimated existing and existing plus project traffic noise levels for this roadway segment are summarized in **Table 3.D.19: Existing and Existing Plus Project Traffic Noise Levels for the Roadway Segment with Highest Increase during PM Peak Hour**.

Based on these estimates, the proposed project or project variants would increase traffic noise by about 1 dBA along this roadway segment. As this segment would have the greatest predicted increase in project-related traffic, noise increases along other roadway segments affected by the proposed project or project variants would be less than 1 dBA. Because this is below the 3-dBA

threshold, the project-generated traffic noise increase along local area roadways would be less than significant.

Table 3.D.39: Existing and Existing Plus Project Traffic Noise Levels for the Roadway Segment with Highest Increase during PM Peak Hour, dBA L_{eq} at 50 Feet

Road Segment	Existing Traffic Noise Levels NOTE A	Existing Plus Project Traffic Noise Levels NOTE A	Estimated Increase in Noise NOTE B
Mariposa Street between Hampshire Street and Potrero Avenue	58.6	60.0	1.4

*Note*s:

[A] Noise levels were determined using Federal Highway Administration TNM Lookup tool, version 2.5. Traffic noise model outputs are included in **EIR Appendix F-4, Operational and Cumulative Traffic Noise Models Outputs**. Road center to receptor distance is approximately 50 feet. Consistent with the traffic study, the analysis assumed 97 percent automobile and 3 percent heavy truck under the existing condition and the existing plus project condition for this roadway segment. Consistent with the traffic study, buses are classified as heavy vehicles. Traffic speeds were set at 30 mph.

[B] Considered significant if the incremental increase in noise from traffic is greater than the existing ambient noise level by 3 dBA L_{eq}.

Source: Operational and Cumulative Traffic Data and Operational and Cumulative Traffic Noise Model Outputs, 2020. See **EIR Appendix F-3, Operational and Cumulative Traffic Data,** and **Appendix F-4**.

CUMULATIVE IMPACTS

This section discusses the cumulative construction and operational noise and vibration impacts that could result from the proposed project or project variants in conjunction with cumulative projects. The geographic area of concern for evaluation of cumulative noise impacts is the area within approximately 0.25 mile of the project site. This is because for noise effects to combine with the project-generated noise and result in a cumulative impact, the noise sources need to be in close proximity to each other. Eleven development projects and two transportation projects have been identified within a 0.25-radius of the project site, including new land development, streetscape, and parking management projects. Cumulative projects considered in the cumulative analysis are listed below in **Table 3.D.20: Distance of Cumulative Projects from Sensitive Receptor Locations** (see **EIR Section 3.A, Introduction to Chapter 3**, pp. 3.A.6-3.A.8, for a description of these projects and **Figure 3.A.1: Cumulative Projects**, p. 3.A.9, for their locations).

Construction

Cumulative noise or vibration impacts associated with construction of the proposed project or project variants would occur if there are other projects located in the project vicinity that could be constructed at the same time, or that could substantially extend the duration of construction noise or vibration received at any nearby sensitive receptors.

The two transportation projects would not combine with construction noise or vibration from the proposed project or project variants because construction of the 16th Street Improvement Project

would be completed prior to initiation of project construction and there are no construction activities associated with Northeast Mission Parking Management Plan.

Table 3.D.20: Distance of Cumulative Projects from Sensitive Receptor Locations

Locations	Distance to the Nearest Sensitive Receptors Identified for the Proposed Project
Development Projects	
1850 Bryant Street	Within 5 feet of R3 (1800 Bryant Street)
321 Florida Street	Within 5 feet of R7 (1746 Bryant Street), R8 (2726 17th Street), and R9 (2730 17th Street)
2435-2445 16th Street	200 feet from R7 (1746 Bryant Street)
681 Florida Street	400 feet from R10 (1960 Bryant Street)
2750 19th Street	490 feet from R10 (1960 Bryant Street)
2747 19th Street	670 feet from R10 (1960 Bryant Street)
333-335 Potrero Avenue	555 feet from R6 (480 Potrero Avenue)
312 Utah Street	660 feet from R6 (480 Potrero Avenue)
300 Kansas Street	1,100 feet from R6 (480 Potrero Avenue)
2601 Mariposa Street	80 feet from R4 (1900 Bryant Street)
480 Potrero Avenue	60 feet from R2 (475 Hampshire Street)
Transportation Projects	
16th Street Improvement Project	
SFMTA Northeast Mission Parking Management Plan	

Of the 11 development projects listed in the **Table 3.D. 20**, only the 2601 Mariposa Street project would not combine with construction noise or vibration from the proposed project or project variants because its construction phase would not overlap with the proposed project or project variants. The construction phases for the other 10 development projects may overlap with the proposed project or project variants, and therefore these projects were considered for cumulative construction noise or vibration impacts.

Impact C-NO-1: Construction noise as a result of the proposed project or project variants, combined with construction noise from cumulative projects in the vicinity, would cause a substantial temporary increase in ambient noise levels. (*Less than Significant with Mitigation)*

Similar to the approach for the project-level analysis, the cumulative analysis provides conservative results by excluding the noise attenuation benefits that intervening structures may provide. Under a conservative assumption, construction of these development projects could overlap with construction of the proposed project, and the 10 development projects could generate construction noise levels that are perceptible at the nearest noise-sensitive receptors due to the low existing ambient noise levels ranging from 57 to 65 dBA L_{eq}. However, among the 10 development projects, seven (except for the 1850 Bryant Street project, the 321 Florida Street project, and the 480 Potrero Avenue project) are located at least 200 feet from the same noise-sensitive receptors as the proposed project or project variants. At a distance of 200 feet, construction noise at the other sites is not likely to combine with that of the proposed project due to the fact that construction noise attenuates

at a rate of 6 dBA for every doubling of distance from the source.[47] However, because the construction noise levels from the proposed project or project variants would exceed the daytime noise threshold of "10 dBA L_{eq} above the ambient noise level," the proposed project or project variants could combine with construction noise from the other future projects and exceed the daytime noise threshold of "10 dBA L_{eq} above the ambient noise level."

Regarding noise from hauling trucks, it is possible that the proposed project or project variants could overlap with construction of future projects and use the same truck routes. As a conservative estimate, assuming construction traffic would travel on the same truck routes at the same time, it is possible that noise from combined truck traffic could increase ambient noise. However, construction duration for the proposed project or project variants would not exceed five years and therefore this activity would be limited in duration. As a result, even if the cumulative construction noise related to hauling trucks could result in a temporary increase in ambient noise levels, the contribution of the proposed project or project variants would be less than cumulatively considerable.

Because the proposed project or project variants could combine with construction noise from the other future projects and exceed the daytime noise threshold of 10 dBA L_{eq} above the ambient noise level, this would result in a potentially significant cumulative construction noise impact.

As discussed above under **Impact NO-1**, implementation of measures in **Mitigation Measure M-NO-1: Construction Noise Control**, pp. 3.D.41-3.D.42, would reduce the proposed project's temporary increases in ambient noise levels to the maximum extent feasible and because the exceedance of both daytime and nighttime construction thresholds would be limited in time. Thus, the potential for construction of the proposed project or project variants to generate noise levels that would result in a substantial temporary increase in ambient noise levels would be less than significant. Because the project's contribution to any cumulative construction noise impact would be of relatively short duration, the project's contribution would be less than cumulatively considerable.

Impact C-NO-2: Construction vibration as a result of the proposed project or project variants, combined with construction vibration from cumulative projects in the vicinity, would not generate excessive groundborne vibration or groundborne noise levels. (*Less than Significant)*

Vibration impacts are localized because vibration dissipates rapidly with increased distance from the source. None of the 10 development projects are located within 232 feet of the KQED building

[47] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018, p. 2-10, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed May 5, 2021.

at 2601 Mariposa Street. Based on the vibration buffer distances shown in **Table 3.D.17**, p. 3.D.40, construction vibration is not likely to cause disturbance to vibration-sensitive equipment at the KQED building (if any). Therefore, future projects would not combine with the proposed project or project variants to result in a potentially significant cumulative impact related to interference with vibration-sensitive equipment at KQED building (if any).

Among the 10 development projects, seven projects (with the exception of the 1850 Bryant Street project, the 321 Florida Street project, and the 480 Potrero Avenue project) are located at least 200 feet away from the same vibration-sensitive receptors as the proposed project or project variants. At a distance of 200 feet, construction vibration is not likely to cause building damage (based on the vibration thresholds and Caltrans guidance [see **Table 3.D.17**]) or be perceptible to sensitive receptors in nearby residences during nighttime construction. The 480 Potrero Avenue project is located within 60 feet from the nearest vibration-sensitive receptor (R2) and would involve interior construction; therefore, vibration impact is not anticipated. The 1850 Bryant Street project and the 321 Florida Street project are located within 5 feet from the nearest vibration-sensitive receptor (R3, R7, R8, and R9) and would involve demolition, excavation, and basement and foundation work. However, the proposed project or project variants would not cause building damage to any of the closest nearby buildings due to the distance of construction-related vibration activities, such as excavation and basement/foundation work, and the buffer distance of 47 feet for structure damage to historic and older buildings (see **Table 3.D.17**). Additionally, implementation of **Mitigation Measure M-NO-2** would ensure that any construction-related vibration impacts on vibration sensitive uses at 2601 Mariposa Street would be reduced to less-than-significant levels. Therefore, construction vibration from cumulative projects would not combine with that from the proposed project or project variants to result in a potentially significant cumulative impact related to vibration damage to buildings and vibration-sensitive uses.

At a distance of 5 feet from the 1850 Bryant Street project or the 321 Florida Street project, sensitive receptors in nearby residences (R3, R7, R8, and R9) would be disturbed if nighttime construction were to occur. Therefore, the proposed project or project variants could combine with construction vibration from the 1850 Bryant Street project and the 321 Florida Street project and result in a potentially significant cumulative construction vibration impact related to disturbance of residences during nighttime construction. However, the potentially significant cumulative construction vibration impact would only occur if the proposed project or project variants and a cumulative project both have nighttime construction at the same time. The potential for two projects to have simultaneous nighttime construction would be low. In addition, the project site is located at least 80 feet from sensitive receptors in nearby residences at R3, R7, R8, or R9 (see **Table 3.D.4**, p. 3.D.11). Based on the buffer distance of 58 feet (see **Table 3.D.17**), nighttime construction of the proposed project or project variants would not generate excessive construction vibration at these vibration-sensitive receptors. Furthermore, nighttime construction of the proposed project or project variants would be limited in duration (i.e., less than two weeks). Therefore, even if a

potentially significant cumulative construction vibration impact could occur, the contribution of the proposed project or project variants to the significant cumulative construction vibration impact would be less than cumulatively considerable.

Operation

Onsite Stationary Sources

Impact C-NO-3: Operation of the proposed project or project variants, combined with operation noise from cumulative projects in the vicinity, would cause a substantial permanent increase in ambient noise levels in the project vicinity. (*Less than Significant)*

The nearest cumulative projects (2601 Mariposa Street, 1850 Bryant Street, and 321 Florida Street) could involve the installation of operation-period stationary sources of noise. Noise from operation of stationary sources at future project sites would be localized and would be required to meet the requirements for operational noise limits identified in the noise ordinance. The noise ordinance limits noise levels for each project at its property boundary. Even if each future project would meet the operational noise limits, the combined noise from these cumulative projects could increase ambient noise levels for nearby sensitive receptors. Therefore, operation of the proposed project or project variants could combine with other cumulative projects and result in a potentially significant operational noise impact.

As discussed above under **Impact NO-3**, implementation of noise reduction measures identified in **Mitigation Measure M-NO-3**: **Fixed Mechanical Equipment Noise Control for Building Operations**, pp. 3.D.48-3.D.49, would ensure compliance with noise ordinance standards, and the project's impact would be reduced to a less-than-significant level. As a result, the contribution of the proposed project or project variants to the significant cumulative operational noise impact is less than cumulatively considerable.

Offsite Traffic

Under a cumulative scenario, an assessment of traffic volumes during the PM peak hour along 22 roadway segments in the project site vicinity was performed. **Table 3.D.21: Modeled PM Peak Hour Traffic Noise Levels for the Most Impacted Locations Under Cumulative Scenario** presents the roadway segments that would experience potential substantial increases in ambient noise levels during the cumulative PM peak hour condition. Two roadway segments would exceed 3 dBA, which is considered a significant cumulative noise impact. Those streets are Mariposa Street between Hampshire Street and Potrero Avenue (from 274 trips to 590 trips) and Hampshire Street north of 17th Street (from 23 trips to 50 trips). It should be noted that there are no noise-sensitive receptors along Hampshire Street north of 17th Street, while noise-sensitive receptors (residential units at 2445 Mariposa Street) are located along Mariposa Street between Hampshire Street and Potrero Avenue.

As shown in **Table 3.D.21** below, none of the cumulative operational noise increase is attributable to the proposed project or project variants along Hampshire Street north of 17th Street; and 0.8 dBA of the cumulative increase is attributable to the proposed project or project variants along Mariposa Street between Hampshire Street and Potrero Avenue, which is below the 3-dBA significance threshold. Therefore, the contribution of the proposed project or project variants to the significant cumulative noise increase is not considerable.

Table 3.D.21: Modeled PM Peak Hour Traffic Noise Levels for the Most Impacted Locations Under Cumulative Scenario, dBA L_{eq} At 50 Feet

Road Segment	(A) Existing Traffic Noise Levels NOTE A	(B) Cumulative Traffic Noise Levels NOTE A	(C) Cumulative Plus Project Traffic Noise Levels NOTE A	(C-A) Difference Between Cumulative Plus Project and Existing NOTE B	(C-B) Difference Between Cumulative Plus Project and Cumulative NOTE C
Mariposa Street between Hampshire Street and Potrero Avenue	58.6	61.2	62.0	3.4	0.8
Hampshire Street north of 17th Street	45.6	49	49	3.4	0

*Note*s:

[A] Noise levels were determined using Federal Highway Administration TNM Lookup tool, version 2.5. Traffic noise model outputs are included in **EIR Appendix F-4**. Road center to receptor distance is approximately 50 feet. Consistent with the traffic study, the analysis assumed 97 percent automobile and 3 percent heavy truck under the existing, cumulative, and cumulative plus project conditions for Mariposa Street between Hampshire Street and Potrero Avenue, and assumed 100 percent automobile for Hampshire Street north of 17th Street. Consistent with the traffic study, buses are classified as heavy vehicles. Traffic speeds were set at 30 mph.

[B] Considered significant if the incremental increase in noise from traffic is greater than the existing ambient noise level by 3 dBA L_{eq}.

[C] Considered significant if the project contribution is greater than 3 dBA L_{eq}.

Source: Operational and Cumulative Traffic Data and Operational and Cumulative Traffic Noise Model Outputs, 2020. See **EIR Appendix F-3** and **Appendix F-4**.

E. AIR QUALITY

INTRODUCTION

EIR Section 3.E, Air Quality, discusses the existing air quality conditions in the project area, presents the regulatory framework for air quality management, and analyzes the potential for the proposed project or project variants to affect existing air quality conditions, both regionally and locally, from activities that emit criteria air pollutant emissions, including emissions of toxic air contaminants such as diesel particulate matter. It analyzes the types and quantities of emissions that would be generated both on a temporary basis from proposed construction activities and over the long term from operation of the proposed project or project variants. The analysis determines whether those emissions are significant in relation to applicable air quality standards and identifies feasible mitigation measures for significant adverse impacts. This section also includes an assessment of potential odor impacts and an analysis of cumulative air quality impacts. The effects of greenhouse gas (GHG) emissions associated with the construction and operation of the proposed project or project variants and associated impacts on climate change and the City's and state's goals for GHG emissions are discussed in the initial study in **Section E.9, Greenhouse Gas Emissions** (see **EIR Appendix B**).

The analysis is based on a review of existing air quality conditions in the Bay Area region and air quality regulations administered by the U.S. Environmental Protection Agency (U.S. EPA), the California Air Resources Board (air resources board), and the Bay Area Air Quality Management District (air district or BAAQMD). This analysis includes methodologies identified in the air district's updated CEQA Air Quality Guidelines[1] and its companion documentation. Calculations were prepared to quantitatively assess the air quality contributions of the proposed project (see **EIR Appendix G: Air Quality Calculation Details and Supporting Information**); this information forms the basis of much of the assessment of air quality impacts presented herein.[2]

The analytical methodologies and approaches are described under "Approach to Analysis" on pp. 3.E.31-3.E.41, and in the Air Quality and Health Risk Assessment Methodology included in **EIR Appendix G**. The approximately three- to four-year construction program would constitute maximum development on the site, with construction estimated to start in 2023 and continue

[1] Bay Area Air Quality Management District (BAAQMD), CEQA Air Quality Guidelines, updated May 2017, *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en,* accessed May 5, 2021.

[2] Separate calculations for each project variant are not provided because the four project variants constitute minor changes: relocation of an internal bus ramp and development of active use on 17th street, the relocation of the emergency bus exit from 17th Street to Hampshire Street, the shifting of a residential lobby from Mariposa Street to Hampshire Street, and a change in the development program to reduce the space allocated for the retail commercial use and introduce a new childcare or other employee and family support use. The project variants' emissions would be substantially similar to those of the proposed project.

through 2026. Although the construction program is defined as occurring over approximately three to four years, for purposes of CEQA the construction and operational air quality emissions analysis assumes a three-year timeframe as it is the most conservative (or worst case) analysis. This is because a shorter construction period results in nearby sensitive receptors being exposed to higher average daily pollutant emissions than if those same construction emissions were spread out over a longer construction period.

Issues identified in public comments to the Notice of Preparation (NOP) of an Environmental Impact Report and Notice of a Public Scoping Meeting (**EIR Appendix A**) related to the proposed project's physical environmental impacts were considered in preparing this analysis. There were no NOP comments related to air quality (see **EIR Chapter 1, Introduction**, pp. 1.3-1.5).

ENVIRONMENTAL SETTING

CLIMATE AND METEOROLOGY

The project site is in the San Francisco Bay Area Air Basin (air basin). The air basin's moderate climate steers storm tracks away from the region for much of the year, although storms generally affect the region from November through April. San Francisco's proximity to the onshore breezes stimulated by the Pacific Ocean provides for generally very good air quality in the City.

Annual temperatures in the project area average in the mid-50s (degrees Fahrenheit), generally ranging from the low 40s on winter mornings to the mid-70s during summer afternoons. Daily and seasonal changes in temperature are small because of the moderating effects of nearby San Francisco Bay. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the "rainy" period from November through April. Precipitation may vary widely from year to year as a shift in the annual storm track of a few hundred miles can mean the difference between a very wet year and drought conditions.

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants regionally. The project area is within the peninsula climatological subregion. Marine air traveling through the Golden Gate is a dominant weather factor affecting dispersal of air pollutants within the region. Westerly to northwesterly winds are the most frequent and strongest winds during all seasons. Existing wind speeds around the project site are approximately 13 miles per hour.[3] Increased temperatures create the conditions in which ozone formation can increase.

[3] RWDI, Potrero Yard Modernization Project Pedestrian Wind Study, September 4, 2020, p. 9 (see **EIR Appendix H**)

AMBIENT AIR QUALITY – CRITERIA AIR POLLUTANTS

As required by the 1970 Federal Clean Air Act, the U.S. EPA initially identified six criteria air pollutants that are pervasive in urban environments and for which state and federal health-based ambient air quality standards have been established. The U.S. EPA calls these pollutants "criteria air pollutants," because it has regulated them by developing specific public health-based and welfare-based criteria for setting permissible levels. Ozone, carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are the six criteria air pollutants originally identified by the U.S. EPA. Since adoption of the 1970 act, subsets of PM have been identified for which permissible levels have been established. These include PM of 10 microns in diameter or less (PM_{10}) and PM of 2.5 microns in diameter or less ($PM_{2.5}$).

The air district is the regional agency with jurisdiction for regulating air quality within the nine-county San Francisco Bay Area Air Basin. The region's air quality monitoring network provides information on ambient concentrations of criteria air pollutants at various locations in the San Francisco Bay Area. **Table 3.E.1: Summary of San Francisco Air Quality Monitoring Data (2015-2019)** presents a five-year summary of the highest annual criteria air pollutant concentrations, recorded at the air quality monitoring station operated and maintained by the air district at 16th and Arkansas streets (Potrero Hill), approximately 0.55 mile east of the project site. **Table 3.E.1** also compares measured pollutant concentrations with the most stringent applicable ambient air quality standards (state or federal). These concentrations are health-based standards established with an ample margin of safety. To determine attainment with air quality standards, exceedances are assessed on a region-wide basis. Concentrations shown in boldface type in the table indicate only a localized exceedance of the standard and not an air basin-wide exceedance of the standard.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG, also sometimes referred to as "volatile organic compounds" [VOCs] by some regulatory agencies) and oxides of nitrogen (NOx) in the presence of sunlight. The main sources of ROG and NOx, often referred to as "ozone precursors," are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels.

In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a "regional air pollutant" because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases, such as asthma, bronchitis, and emphysema.

Table 3.E.1: Summary of San Francisco Air Quality Monitoring Data (2015-2019)

Pollutant	Most Stringent Applicable Standard	Maximum Concentrations Measured and Number of Days Standards Were Exceeded [NOTE A]				
		2015	2016	2017	2018	2019
Ozone						
Maximum 1-Hour Concentration (ppm)	>0.09 [NOTE B]	0.085	0.070	0.087	0.065	0.091
Days 1-Hour Standard Exceeded		0	0	0	0	0
Maximum 8-Hour Concentration (ppm)	>0.070 [NOTES B & C]	0.067	0.057	0.054	0.049	**0.073**
Days 8-Hour Standard Exceeded		0	0	0	0	1
Carbon Monoxide (CO)						
Maximum 1-Hour Concentration (ppm)	>20 [NOTE B]	1.8	1.7	2.5	1.9	1.2
Days 1-Hour Standard Exceeded		0	0	0	0	0
Maximum 8-Hour Concentration (ppm)	>9.0 [NOTES B & C]	1.3	1.1	1.4	1.6	1.0
Days 8-Hour Standard Exceeded		0	0	0	0	0
Respirable Particulate Matter (PM_{10})						
Maximum 24-Hour Concentration ($\mu g/m^3$)	>50 [NOTE B]	47	29	**77**	43	42
Days 24-Hour Standard Exceeded [NOTE D]		0	0	2	0	0
Fine Particulate Matter ($PM_{2.5}$)						
Maximum 24-Hour Concentration ($\mu g/m^3$)	>35 [NOTE C]	**35.4**	19.6	**49.9**	**177.4**	25.4
Days 24-Hour Standard Exceeded		0	0	7	14	0
Annual Average ($\mu g/m^3$)	>12 [NOTES B & C]	7.6	7.5	9.7	11.7	7.7
Nitrogen Dioxide (NO_2)						
Maximum 1-Hour Concentration (ppm)	>0.100 [NOTE C]	0.071	0.058	0.073	0.069	0.061
Days 1-Hour Standard Exceeded		0	0	0	0	0

Notes: **Boldface** values are in excess of applicable standard; ppm = parts per million; µg/m3 = micrograms per cubic meter; > = greater than

[A] Number of days exceeded is for all days in a given year, except for PM_{10}, which has been monitored once every 12 days as of January 2013.

[B] State standard, not to be exceeded.

[C] Federal standard, not to be exceeded.

[D] Based on a sampling schedule of 1 out of every 12 days, for a total of approximately 30 samples per year.

Source: BAAQMD, Annual Bay Area Air Pollution Quality Summaries, 2015-2019, *https://www.baaqmd.gov/about-air-quality/air-quality-summaries*, accessed November 9, 2020.

According to published data, and as shown in **Table 3.E.1**, p. 3.E.4, the most stringent applicable standards for ozone (state 1-hour standard of 0.09 parts per million [ppm] and the federal 8-hour standard of 0.070 ppm) were not exceeded in San Francisco between 2015 and 2018. In 2019 the federal 8-hour ozone standard was exceeded once. In 2015, the U.S. EPA strengthened the 8-hour ozone standard to 0.070 ppm, and the new standard became effective December 28, 2015.

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal. As shown in **Table 3.E.1**, the more stringent state CO standards were not exceeded between 2015 and 2019. Measurements of CO indicate hourly maximums ranging between approximately 6 and 13 percent of the more stringent state standard, and maximum 8-hour CO levels that are approximately 11 to 18 percent of the allowable 8-hour standard.

Particulate Matter

Particulate matter is a class of air pollutants that consists of a complex mix of solid and liquid airborne particles from human-made and natural sources. Particulate matter is measured in two size ranges: PM_{10} and $PM_{2.5}$. In the Bay Area, motor vehicles generate about one-half of the air basin's particulates through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the air resources board, studies in the United States and elsewhere "have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks," and studies of children's health in California have demonstrated that particle pollution "may significantly reduce lung function growth in children."[4] The air resources board also reports that statewide attainment of PM standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[5]

[4] California Air Resources Board, Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007, p. 1.

[5] California Air Resources Board, Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007, p. 1.

Among the criteria pollutants that are regulated, particulates appear to represent a serious ongoing health hazard. As long ago as 1999, the air district was reporting, in its CEQA Air Quality Guidelines, that studies had shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area. $PM_{2.5}$ is of particular concern because epidemiological[6] studies have demonstrated that people who live near freeways, especially people who live within 500 feet of freeways or high-traffic roadways and are exposed to vehicle-emitted $PM_{2.5}$, have poorer health outcomes, including increased asthma symptoms and respiratory infections and decreased pulmonary function and lung development in children.[7]

As shown in **Table 3.E.1**, p. 3.E.4, the state 24-hour PM_{10} standard was exceeded on two monitored occasions between 2015 and 2019 in San Francisco (both in 2017 during the wildfire period in the counties to the north of San Francisco). It may be conservatively estimated that the state 24-hour PM_{10} standard of 50 micrograms per cubic meter ($\mu g/m^3$) was exceeded on up to 24 days per year between 2015 and 2019.[8] The federal 24-hour $PM_{2.5}$ standard was exceeded on 21 monitored occasions between 2015 and 2019 in San Francisco. The federal and state annual average standards were not exceeded between 2015 and 2019. Starting in 2017 increasing levels of $PM_{2.5}$ levels were recorded, with the most notable increase in 2018 because of a very active and extreme wildfire season. Although not as notable in 2019, these events have become more frequent and extreme as evidenced in 2020 in which the entire Bay Area and much of California experienced one of the largest and most extreme wildfire seasons in recorded California history in terms of the number of wildfires, acres burned, and damage. The extreme nature of recent wildfires is increasingly a result of changing weather patterns including higher temperatures, decreasing rainfall, and shifting winds that result in low moisture content in trees and plants and high flammability. The health effects of this exposure include eye and throat irritation, coughing, and difficulty breathing; all of which could exacerbate the health effects on persons with asthma or other pre-existing respiratory conditions and also for those who may have contracted COVID-19. The long-term health effects of COVID-19 on the respiratory system are unknown but may be compounded by PM exposure. The public health response to these potentially overlapping environmental conditions continues to focus on the importance of staying inside during extreme wildfire events.

Nitrogen Dioxide

NO_2 is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation,

[6] Epidemiology is a branch of medical science that deals with the incidence, distribution, and control of disease in a population.

[7] San Francisco Department of Public Health (SFDPH), Assessment and Mitigation of Air Pollutant Health Effect from Intra-urban Roadways: Guidance for Land Use Planning and Environmental Review, May 2008, p. 7.

[8] PM_{10} was sampled every twelfth day; therefore, actual days over the standard can be estimated to be up to twelve times the numbers listed in the table. $PM_{2.5}$ is continuously monitored.

NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component of the air on high-pollution days, especially in conjunction with high ozone levels. The current state 1-hour standard for NO_2 (0.18 ppm) is being met in San Francisco. In 2010, the U.S. EPA implemented a new 1-hour NO_2 standard (0.10 ppm), which is presented in **Table 3.E.2: State and Federal Ambient Air Quality Standards and Attainment Status for the San Francisco Bay Area Air Basin**. Currently, the air resources board is recommending that the San Francisco Bay Area Air Basin be designated as an attainment area for the new standard.[9] As shown in **Table 3.E.1**, p. 3.E.4, this new federal standard was not exceeded at the San Francisco station between 2015 and 2019.

Table 3.E.2: State and Federal Ambient Air Quality Standards and Attainment Status for the San Francisco Bay Area Air Basin

Pollutant	Averaging Time	State (CAAQS NOTE A)		Federal (NAAQS NOTE B)	
		Standard	Attainment Status	Standard	Attainment Status
Ozone	1-hour	0.09 ppm	**N**	NA	See **NOTE C**
	8-hour	0.070 ppm	**N**	0.070 ppm NOTE D	**N**; See **NOTE E**
Carbon Monoxide (CO)	1-hour	20 ppm	A	35 ppm	A
	8-hour	9 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	A	0.100 ppm	See **NOTE F**
	Annual	0.030 ppm	NA	0.053 ppm	A
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	A	0.075 ppm	See **NOTE G**
	24-hour	0.04 ppm	A	0.14 ppm	See **NOTE G**
	Annual	NA	NA	0.03 ppm	See **NOTE G**
Particulate Matter (PM_{10})	24-hour	50 µg/m^3	**N**	150 µg/m^3	U
	Annual NOTE H	20 µg/m^3	**N** NOTE I	NA	NA; See **NOTE J**
Fine Particulate Matter ($PM_{2.5}$)	24-hour	NA	NA	35 µg/m^3	**N**; See **NOTE K**
	Annual	12 µg/m^3	**N** NOTE I	12 µg/m^3	U/A; See **NOTE L**
Sulfates	24-hour	25 µg/m^3	A	NA	NA
Lead	30-day	1.5 µg/m^3	A	NA	NA
	Cal. Quarter	NA	NA	1.5 µg/m^3	A
	Rolling 3-month average	NA	NA	0.15	U; See **NOTE M**
Hydrogen Sulfide	1-hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8-hour	See **NOTE N**	U	NA	NA

[9] California Air Resources Board, Recommended Area Designations for the 2010 Nitrogen Dioxide Standards, Technical Support Document, January 2011, *https://www.epa.gov/sites/production/files/2016-04/documents/09carec2.pdf*, accessed May 5, 2021.

Notes: A = Attainment; **N** = Non-attainment; U = Unclassified; NA = Not Applicable, no applicable standard; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

[A] CAAQS = state ambient air quality standards (California). CAAQS for ozone, CO (except Lake Tahoe), SO_2 (1-hour and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.

[B] NAAQS = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentration is 0.07 ppm or less. The 24-hour PM_{10} standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one on average over a 3-year period. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98th percentile is equal to or less than the standard.

[C] The U.S. EPA revoked the national 1-hour ozone standard on June 15, 2005.

[D] This federal 8-hour ozone standard was approved by U.S. EPA in October 2015 and became effective on December 28, 2015.

[E] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over three years, is equal to or less than 0.070 ppm. U.S. EPA made recommendations on attainment designations for California on October 3, 2016. In July 2018 the U.S. EPA finalized area designations. Nonattainment areas will have until 2020 to late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.

[F] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

[G] On June 2, 2010, the U.S. EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO_2 NAAQS, however, must continue to be used until one year following U.S. EPA initial designations of the new 1-hour SO_2 NAAQS. U.S. EPA classified the San Francisco Bay Area Air Basin as being in Attainment/Unclassifiable in January 2018 (Federal Register Vol. 83, No. 6, pp. 1098-1172).

[H] State standard = annual geometric mean; national standard = annual arithmetic mean.

[I] In June 2002, the California Air Resources Board established new annual standards for $PM_{2.5}$ and PM_{10}.

[J] The U.S. EPA revoked the annual PM_{10} NAAQS in 2006.

[K] On January 9, 2013, the U.S. EPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. This U.S. EPA rule suspends key state implementation plan requirements as long as monitoring data continue to show that the Bay Area attains the standard. Despite this U.S. EPA action, the Bay Area will continue to be designated as "non-attainment" for the national 24-hour $PM_{2.5}$ standard until such time as the air district submits a "redesignation request" and a "maintenance plan" to the U.S. EPA, and U.S. EPA approves the proposed redesignation.

[L] In December 2012, the U.S. EPA strengthened the annual $PM_{2.5}$ NAAQS from 15 to 12 $\mu g/m^3$. In December 2014, the U.S. EPA issued final area designations for the 2012 primary annual $PM_{2.5}$ NAAQS. Areas designated "unclassifiable/attainment" must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.

[M] National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

[N] Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Sources: BAAQMD, Standards and Attainment Status, last updated January 5, 2017, *https://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status*, accessed November 9, 2020; U.S. EPA National Ambient Air Quality Standards, last updated December 20, 2016, *https://www.epa.gov/criteria-air-pollutants/naaqs-table*, accessed November 9, 2020.

The U.S. EPA has also established requirements for a new monitoring network to measure NO_2 concentrations near major roadways in urban areas with a population of 500,000 or more. Sixteen new near-roadway monitoring sites are required in California, three of which are in the Bay Area. These monitors are located in Berkeley, Oakland, and San Jose. The Oakland station commenced operation in February 2014, the San Jose station in March 2015, and the Berkeley station in

July 2016.[10] The new monitoring data may result in a need to change area designations in the future. The air resources board will revise the area designation recommendations, as appropriate, once the new monitoring data become available.

Sulfur Dioxide

SO_2 is a colorless, acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease.[11] Pollutant trends suggest that the San Francisco Bay Area Air Basin currently meets and will continue to meet the state standard for SO_2 for the foreseeable future.

In 2010, the U.S. EPA implemented a new 1-hour SO_2 standard, which is presented in **Table 3.E.2**, pp. 3.E.7-3.E.8. The U.S. EPA initially designated the air basin as an attainment area for SO_2. Similar to the new federal standard for NO_2, the U.S. EPA established requirements for a new monitoring network to measure SO_2 concentrations beginning in January 2013.[12] No additional SO_2 monitors are required for the Bay Area because the air district's jurisdiction has never been designated as non-attainment for SO_2 and no state implementation plans or maintenance plans have been prepared for SO_2. The U.S. EPA designated the entire state as attainment/unclassifiable as of December 2017.[13]

Lead

Leaded gasoline (phased out from use in automobiles in the United States beginning in 1973), paint (on older houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects, which put children at special risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline in automobiles was eliminated.

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[10] BAAQMD, 2019 Air Monitoring Network Plan, July 1, 2019, pp. 38-42, *https://www.baaqmd.gov/~/media/files/technical-services/2019_network_plan-pdf.pdf?la=en*, accessed September 17, 2020.

[11] BAAQMD, CEQA Air Quality Guidelines, May 2017, p. C-16, *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en*, accessed May 5, 2021.

[12] U.S. Environmental Protection Agency (U.S. EPA), Fact Sheet: Revisions to the Primary National Ambient Air Quality Standard, Monitoring Network, and Data Reporting Requirements for Sulfur Dioxide, June 2, 2010, *https://www.epa.gov/sites/production/files/2016-05/documents/final_primary_naaqs_factsheet.pdf,* accessed May 5, 2021.

[13] BAAQMD, 2019 Air Monitoring Network Plan, July 1, 2019, p. 34-36, *https://www.baaqmd.gov/~/media/files/technical-services/2019_network_plan-pdf.pdf?la=en*, accessed May 5, 2021.

Ambient lead concentrations are monitored only on an as-warranted, site-specific basis in California. On October 15, 2008, the U.S. EPA strengthened the national ambient air quality standard for lead by lowering it from 1.50 μg/m^3 to 0.15 μg/m^3 on a rolling three-month average. The U.S. EPA revised the monitoring requirements for lead in December 2010.[14] These requirements focus on airports and large urban areas and resulted in an increase in 76 monitors nationally. In the Bay Area, lead monitoring stations are located at Reid-Hillview Airport and at 158 East Jackson Street, both in San Jose. Another lead monitoring station, at San Carlos Airport, was discontinued as of April 11, 2017.

Air Quality Index

The U.S. EPA developed the Air Quality Index (AQI) scale to make the public health impacts of air pollution concentrations easily understandable. The AQI, much like an air quality "thermometer," translates daily air pollution concentrations into a number on a scale between 0 and 500 and assigns the number to one of the following six color-coded ranges that rank air quality:

- **Good (Green, AQI = 0–50):** Air quality is considered satisfactory, and air pollution poses little or no risk.
- **Moderate (Yellow, AQI = 51–100):** Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. Unusually sensitive people should consider reducing prolonged or heavy outdoor exertion.
- **Unhealthy for Sensitive Groups (Orange, AQI = 101–150):** Although the general public is not likely to be affected at this AQI range, people with lung disease as well as older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults, and children are at greater risk from the presence of particles in the air. Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged or heavy outdoor exertion.
- **Unhealthy (Red, AQI = 151–200):** Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects. Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
- **Very Unhealthy (Purple, AQI = 201–300):** The rating of "very unhealthy" air quality would trigger a health alert signifying that everyone may experience more serious health effects. Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit outdoor exertion.

[14] U.S. EPA, Fact Sheet: Revisions to Lead Ambient Air Quality Monitoring Requirements, *https://www.epa.gov/sites/production/files/2016-03/documents/leadmonitoring_finalrule_factsheet.pdf,* accessed May 5, 2021.

- **Hazardous (Maroon, AQI = 301–500):** The rating of "hazardous" air quality would trigger health warnings of emergency conditions. The entire population is more likely to be affected. Everyone, especially children, should limit outdoor exertion.

The AQI numbers refer to specific amounts of pollution in the air. They are based on the federal air quality standards for ozone, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. In most cases, the federal standard for these air pollutants corresponds to the number 100 on the AQI chart. If the concentration of any of these pollutants rises above its respective standard, the air quality can be unhealthy for the public. In determining the air quality forecast, local air districts, including the Bay Area Air Quality Management District, use the anticipated concentration measurements for each of the major pollutants, convert them into AQI numbers, and determine the highest AQI for each zone in a district.

Readings below 100 on the AQI scale would not typically affect the health of the general public (although readings in the moderate range of 50 to 100 may affect unusually sensitive people). Levels above 300 rarely occur in the United States. AQI statistics over recent years indicate that air quality in the Bay Area is predominantly in the "Good" or "Moderate" categories and is healthy on most days for most people. Historical air district data indicate that the San Francisco Bay Area Air Basin experienced air quality in the red level (unhealthy) on 24 days between 2016 and 2019.[15] A number of these unhealthy days are attributable to the increasing frequency of wildfires. In the Bay Area the fire season generally occurs between May and October with the peak period between July and October when dry winds blow and prior to the first significant precipitation of the fall or winter; however, those parameters are shifting with climate change. The 2017 wildfires in northern California resulted in violations of the federal 24-hour $PM_{2.5}$ standard on seven days in September and October, as reported at the air district's Arkansas Street Station in San Francisco. The 2018 wildfires in northern California also resulted in violations, with one day reported in August and 12 days in November.[16] There were no recorded violations of the federal 24-hour $PM_{2.5}$ standard in 2019.

The August and September 2020 wildfires in northern California and in other parts of the state resulted in violations of the federal 24-hour $PM_{2.5}$ standard, although data for 2020 have yet to be tabulated by the air resources board and BAAQMD. Even though the air district's data have not been validated yet, these levels of $PM_{2.5}$ in many counties have been the highest levels recorded in

[15] BAAQMD, Air Quality Index for Fine Particulate Matter ($PM_{2.5}$), 2016-2019, *https://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data/#/aqi?id=316&date=2016-01-01&view=daily*, accessed November 9, 2020.

[16] BAAQMD, Final Particulate Matter Daily Measurements (San Francisco - Arkansas Street Station), October 2017, *https://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data/#/airp?id=316&style=table&zone=-1&date=2017-10-01&view=daily*, and November 2018, *https://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data/#/airp?id=316&style=table&zone=-1&date=2018-11-01&view=daily*, accessed November 9, 2020.

recent times. As a result, the AQI in several neighboring counties reached the "very unhealthy" designation, ranging from values of 201 to 300. During that period, the air district issued over 30 "Spare the Air" alerts and recommended that individuals stay inside with windows closed and refrain from significant outdoor activity.[17] Wildfires appear to be occurring with increasing frequency in California and the Bay Area as climate changes (since 2000, 17 of the state's 20 largest wildfires and 16 of the state's 20 most destructive fires on record have occurred).[18]

As shown in **Table 3.E.3: Air Quality Index Statistics for the San Francisco Bay Area Air Basin**, the air basin had a total of 15 orange-level (unhealthy for sensitive groups) days in 2016, 9 days in 2017, 10 days in 2018, and 10 days in 2019. Between 2016 and 2019, the air basin experienced a total of 19 red-level (unhealthy) days and eight purple-level (very unhealthy) days, the latter of which were likely caused by the October 2017 and November 2018 wildfires.

Table 3.E.3: Air Quality Index Statistics for the San Francisco Bay Area Air Basin

Air Quality Index Levels	Number of Days by Year			
	2016	2017	2018	2019
Unhealthy for Sensitive Groups (Orange)	15	9	10	10
Unhealthy (Red)	2	9	8	0
Very Unhealthy (Purple)	0	3	5	0

Source: BAAQMD, Air Quality Index, 2016-2019, *https://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data/#/aqi-highs?date=2016-01-01&view=daily*, accessed November 9, 2020.

TOXIC AIR CONTAMINANTS AND LOCAL HEALTH RISKS AND HAZARDS

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long duration) and acute (i.e., severe but short-term) adverse effects on human health, including carcinogenic effects.[19] Human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

Unlike criteria air pollutants, TACs are not subject to ambient air quality standards but are regulated by the air district using a risk-based approach to determine which sources and pollutants to control

[17] BAAQMD, Data and Records, *https://www.sparetheair.org/understanding-air-quality/data-and-records/pm-data* and *https://www.sparetheair.org/understanding-air-quality/data-and-records/ozone-data*, accessed September 14, 2020.

[18] Cal Fire, Stats & Events, Top 20 Largest California Wildfires, April 28, 2021, *https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf*, and Top 20 Most Destructive California Wildfires, April 28, 2021, *https://www.fire.ca.gov/media/t1rdhizr/top20_destruction.pdf*, accessed April 28, 2021.

[19] "Carcinogenic" indicates that scientific studies have shown that exposure to a substance or mixture of substances at certain levels for some period of time has the potential to promote the formation of cancer.

as well as the degree of control. A health risk assessment is an analysis that estimates human health exposure to toxic substances and, when considered together with information regarding the toxic potency of the substances, provides quantitative estimates of health risks.[20]

Exposures to fine PM ($PM_{2.5}$) are strongly associated with mortality, respiratory diseases, and impaired lung development in children, as well as other end results, such as hospitalization for cardiopulmonary disease.[21] In addition to $PM_{2.5}$, diesel PM (DPM), a byproduct of diesel fuel combustion, is also of concern. The air resources board identified DPM as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans.[22] The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

San Francisco Modeling of Air Pollution Exposure Zones

In an effort to identify areas of San Francisco most adversely affected by sources of TACs, the planning and public health departments partnered with the air district to inventory and assess air pollution and exposures from on-road vehicles, permitted stationary sources, Caltrain passenger diesel locomotives, ships and harbor craft, and ferry boats within San Francisco. Citywide air quality dispersion modeling was conducted using the U.S. EPA's atmospheric dispersion modeling system (AERMOD)[23] to estimate concentrations of PM_{10} (DPM is assumed equivalent to PM_{10}), $PM_{2.5}$, and total organic gases (TOG) on a 20-by-20-meter receptor grid covering the entire city. The citywide modeling results were used to support the San Francisco Citywide Health Risk Assessment (Citywide health risk assessment), which is a comprehensive assessment of existing cumulative exposures to air pollution throughout the city. The methodology and technical documentation for modeling citywide air pollution are available in the San Francisco Citywide Health Risk Assessment: Technical Support Documentation.[24]

Modeling results from the Citywide health risk assessment were used to identify areas in the city with poor air quality, termed Air Pollutant Exposure Zones (APEZs), based on the following health-

[20] In general, a health risk assessment is required if the air district concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. The applicant is then subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, estimating the increased risk of cancer as a result of exposure to one or more TACs.

[21] SFDPH, Assessment and Mitigation of Air Pollutant Health Effects from Intra-Urban Roadways: Guidance for Land Use Planning and Environmental Review, May 2008.

[22] California Air Resources Board, Fact Sheet: The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines, October 1998.

[23] AERMOD is the U.S. EPA's preferred or recommended steady state air dispersion plume model. For more information on AERMOD and to download the AERMOD Implementation Guide, *https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models*, accessed September 18, 2020.

[24] San Francisco Department of Public Health, 2020, San Francisco Citywide Health Risk Assessment: Technical Support Documentation, September 2020.

protective criteria: (1) cumulative $PM_{2.5}$ concentrations equal to or greater than 10 $\mu g/m^3$; and/or (2) excess cancer risk from the contribution of emissions from all modeled sources equal to or greater than 100 per 1 million persons exposed.

A health vulnerability layer was incorporated in the APEZ for those San Francisco ZIP codes in the worst quintile of Bay Area Health Vulnerability scores (ZIP Codes 94102, 94103, 94110, 94124, and 94134). In these areas, the standard for identifying areas as being within the APEZ were lowered to (1) excess cancer risk from the contribution of emissions from all modeled sources equal to or greater than 90 per 1 million persons exposed; and/or (2) cumulative $PM_{2.5}$ concentrations greater than 9 $\mu g/m^3$.

Lastly, all parcels within 500 feet of a major freeway were also included in the APEZ, consistent with findings in the air resources board's Air Quality and Land Use Handbook: A Community Health Perspective, which suggests air pollutant levels decrease substantially at approximately 500 feet from a freeway.[25]

Based on the modeling results of the Citywide health risk assessment, the project site is in a mapped APEZ and is located within a heath vulnerable zip code.[26] All parcels within 1,000 feet of the project site are also in the mapped APEZ. The following provides additional support for the APEZ criteria discussed above.

Fine Particulate Matter

In April 2011, the U.S. EPA published Policy Assessment for the Particulate Matter Review of the National Ambient Air Quality Standards. In this document, U.S. EPA staff conclude that the then-current federal annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ should be revised to a level within the range of 13 to 11 $\mu g/m^3$, with evidence strongly supporting a standard within the range of 12 to 11 $\mu g/m^3$. In December 2012, the U.S. EPA strengthened the annual $PM_{2.5}$ standard from 15 to 12 $\mu g/m^3$ and issued final area designations based on that standard. The U.S. EPA published a new policy assessment in January 2020.[27] The policy assessment did not include recommendations to change the standards for particulate matter. APEZs for San Francisco are based on the health-protective $PM_{2.5}$ standard of 11 $\mu g/m^3$, as supported by the U.S. EPA's Policy Assessment for the Particulate

[25] California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective, April 2005, *http://www.arb.ca.gov/ch/handbook.pdf*, accessed May 5, 2021.

[26] San Francisco Planning Department, Property Information Map, Air Pollution Exposure Zone (2020), *https://sfplanninggis.org/pim/map.html?search=2500%20Mariposa%20street&layers=Air%20Pollutant%20Exposure%20Zone*, accessed on May 5, 2021.

[27] U.S. EPA, Policy Assessment for the Review of the National Ambient Air Quality Standards for Particulate Matter, January 2020, *https://www.epa.gov/sites/production/files/2020-01/documents/final_policy_assessment_for_the_review_of_the_pm_naaqs_01-2020.pdf*, and *https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm*, accessed November 9, 2020.

Matter Review of the National Ambient Air Quality Standards, although lowered to 10 $\mu g/m^3$ to account for uncertainty in accurately predicting air pollutant concentrations using emissions modeling programs.

Excess Cancer Risk

The 100-per-1-million-persons-exposed (100 excess cancer risk) criterion discussed in "San Francisco Modeling of Air Pollution Exposure Zones," pp. 3.E.13-3.E.14, is based on U.S. EPA guidance for conducting air toxic analyses and making risk management decisions at the facility and community-scale level.[28] As described by the air district, the U.S. EPA considers a cancer risk of 100 per 1 million or less to be within the "acceptable" range of cancer risk. Furthermore, in the 1989 preamble to the benzene National Emissions Standards for Hazardous Air Pollutants rulemaking,[29] the U.S. EPA states that it "…strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately one in one million and (2) limiting to no higher than approximately one in ten thousand [100 in one million] the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years." The 100-per-1-million-excess-cancer-cases criterion is also consistent with the ambient cancer risk in the most pristine portions of the Bay Area based on the air district's regional modeling.[30]

In addition to monitoring criteria pollutants, both the air district and the air resources board operate TAC monitoring networks in the San Francisco Bay Area Air Basin. These stations measure 10 to 15 TACs, depending on the station. The TACs selected for monitoring are those that traditionally have been found in the highest concentrations in ambient air and therefore tend to produce the most significant risk. The air district's ambient TAC monitoring station nearest to the project site is at 10 Arkansas Street, San Francisco, approximately 0.5 mile east of the project site. The ambient concentrations of carcinogenic TACs measured at the Arkansas Street station are presented in **Table 3.E.4: 2018 Annual Average Ambient Concentrations of Carcinogenic Toxic Air Measured at BAAQMD Monitoring Station, 10 Arkansas Street, San Francisco**. The estimated cancer risk from a lifetime exposure (70 years) to these substances is also shown. When TAC measurements at this station are compared to ambient concentrations of various TACs for the Bay Area as a whole, the cancer risks associated with mean TAC concentrations in San Francisco are similar to those for the Bay Area as a whole. Therefore, the estimated average lifetime cancer risk

[28] BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, p. 67, *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/revised-draft-ceqa-thresholds-justification-report-oct-2009.pdf?la=en,* accessed September 18, 2020.

[29] 54 Federal Register 38044, September 14, 1989.

[30] BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, p. 67.

resulting from exposure to TAC concentrations monitored at the San Francisco station does not appear to be any greater than that for the Bay Area as a region.

Table 3.E.4: 2018 Annual Average Ambient Concentrations of Carcinogenic Toxic Air Contaminants Measured at BAAQMD Monitoring Station, 10 Arkansas Street, San Francisco

Substance	Concentration	Cancer Risk per Million [NOTE A]
Gaseous TACs (ppb)		
Acetaldehyde [NOTE B]	0.69	10
Benzene	0.189	49
1,3-Butadiene	0.033	36
Carbon Tetrachloride	0.072	55
Chloroform	0.022	2
Para-Dichlorobenzene	*	*
cis-1,3-Dichloropropene	0.05	10
trans-1,3-Dichloropropene	0.05	10
Ethyl Benzene	0.11	3
Ethylene Dibromide	*	*
Ethylene Dichloride	*	*
Formaldehyde [NOTE B]	1.64	35
Methyl Tertiary-Butyl Ether (MTBE)	*	*
Methylene Chloride	0.099	1
Perchloroethylene	0.008	1
Trichloroethylene	0.010	0.3
Polycyclic Aromatic Hydrocarbons (ng/m^3)		
Benzo(a)pyrene	*	*
Benzo(b)fluoranthene	*	*
Benzo(k)fluoranthene	*	*
Dibenz(a,h)anthracene	*	*
Indeno(1,2,3-cd)pyrene	*	*
Particulate TACs (ng/m^3)		
Arsenic [NOTE A]	0.92	9
Beryllium [NOTE B]	0.150	1
Cadmium [NOTE B]	0.70	9
Chromium (Hexavalent) [NOTE B]	0.045	19
Lead	*	*
Nickel [NOTE B]	3.2	2
Total Risk for All TACs		**252.3**

Notes: TACs = toxic air contaminants; BAAQMD = Bay Area Air Quality Management District; ppb = part per billion; ng/m^3 = nanograms per cubic meter; *= indicates that insufficient or no data were available to determine the value

[A] Cancer risks were estimated by applying published unit risk values to the measured concentrations. The potential cancer risk estimates reflect the most recent risk assessment methodology finalized by the Office of Environmental Health Hazard Assessment on March 6, 2015. Information on the agency's new risk assessment methodology can be found at *http://www.oehha.ca.gov/air/hot_spots/hotspots2015.html*.

[B] Reported concentrations and cancer risks are from 2017.

Source: California Air Resources Board, Annual Toxics Summaries by Monitoring Sites, *https://www.arb.ca.gov/adam/toxics/sitesubstance.html*, accessed September 18, 2020.

Roadway-Related Pollutants

Motor vehicles are responsible for a large share of air pollution, especially in California. Vehicle tailpipe emissions contain diverse forms of particles and gases, and vehicles also contribute to particulates by generating road dust through tire wear. Epidemiological studies have demonstrated that people living close to freeways or busy roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections, and decreased pulmonary function and lung development in children. Air pollution monitoring conducted in conjunction with epidemiological studies has confirmed that roadway-related health effects vary with modeled exposure to PM and NO_2. In traffic-related studies, the additional non-cancer health risk attributable to roadway proximity was seen within 1,000 feet of the roadway and was strongest within 300 feet.[31] As a result, the air resources board recommends that new sensitive land uses not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day.

Diesel Particulate Matter

As stated on p. 3.E.13, the air resources board identified DPM as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways. The air resources board estimated that, as of 2000, the average Bay Area cancer risk from exposure to DPM, based on a population-weighted average ambient DPM concentration, is approximately 480 in 1 million, which is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. The average statewide cancer risk from DPM as determined by the air resources board declined from 750 in 1 million in 1990 to 540 in 1 million in 2000.[32,33] By 2012, the air resources board estimated the average statewide cancer risk from DPM at 520 in 1 million.[34]

In 2000, the air resources board approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. Subsequent

[31] California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective, April 2005, *https://www.arb.ca.gov/ch/handbook.pdf,* accessed May 5, 2021.

[32] California Air Resources Board, California Almanac of Emissions and Air Quality - 2009 Edition, Table 5-44 and Figure 5-12.

[33] This calculated cancer risk value from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which for women is more than 38 percent and for men is more than 40 percent (based on a sampling of 17 regions nationwide), or roughly greater than 380,000 to 400,000 in 1 million, according to the American Cancer Society. American Cancer Society, last revised January 13, 2020, *http://www.cancer.org/cancer/cancerbasics/lifetime-probability-of-developing-or-dying-from-cancer,* accessed September 18, 2020.

[34] California Air Resources Board, Overview: Diesel Exhaust and Health, *https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health*, accessed September 18, 2020.

regulations approved by the air resources board apply to new trucks and diesel fuel. With new controls and fuel requirements, a medium-heavy duty or heavy-heavy duty truck built in 2010 or later would have particulate exhaust emissions that are over 50 times lower than a medium-heavy duty or heavy-heavy duty truck built before 1990.[35] The regulations are anticipated to result in an 80 percent decrease in statewide diesel health risk in 2020 as compared with the diesel risk in 2000. Despite notable emission reductions, the air resources board recommends that proximity to sources of DPM emissions be considered in the siting of new sensitive land uses. The air resources board notes that these recommendations are advisory and should not be interpreted as defined "buffer zones," and that local agencies must balance other considerations, including transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. The position of the air resources board is that with careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, infill development, mixed-use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.[36]

SENSITIVE RECEPTORS

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young; those with higher rates of respiratory disease, such as asthma and chronic obstructive pulmonary disease; and those with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases. The air district defines sensitive receptors as children, adults, and seniors occupying or residing in residential dwellings, schools, daycare centers, hospitals, and senior-care facilities. Workers are not considered sensitive receptors because all employers must follow regulations set forth by the Occupation Safety and Health Administration to ensure the health and well-being of their employees.[37]

The proximity of sensitive receptors to motor vehicles is an air pollution concern, especially in San Francisco where building setbacks are limited and roadway volumes are higher than in most other parts of the Bay Area. Vehicles also contribute to particulates by generating road dust and through tire wear.

[35] Pollution Engineering, New Clean Diesel Fuel Rules Start, July 2006, and California Air Resources Board, Evaluation of Particulate Matter Filters in On-Road Heavy-Duty Diesel Vehicle Applications, May 8, 2015, p. 23, *https://ww3.arb.ca.gov/msprog/onrdiesel/documents/dpfeval.pdf*, accessed May 5, 2021.

[36] California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective, April 2005, *http://www.arb.ca.gov/ch/handbook.pdf,* accessed May 5, 2021.

[37] BAAQMD, Recommended Methods for Screening and Modeling Local Risks and Hazards, May 2011, p. 12.

Existing receptors evaluated in this analysis include a representative sample of known residents (children and adults) in the surrounding neighborhood, and other sensitive receptors (school children, daycare facilities, etc.) located in the surrounding community and along the expected travel routes of the on-road delivery and haul trucks in the project vicinity. The health risk impact analysis includes receptor locations within a 1,000-foot radius from the project site, which is conservative because the maximum impacts identified from the construction and operation of the proposed project or project variants would be closer to the emissions sources and adjacent to the site (see **Figure 3.D.1**, p. 3.D.9, in **EIR Section 3.D, Noise and Vibration**). In addition to the residential receptors, two daycare facilities and a middle school were identified within 1,000 feet of the project site, as follows:

- Sweet Peas Preschool at 2730 17th Street is approximately 240 feet west.
- Brightworks School at 1960 Bryant Street is approximately 280 feet south.
- Las Luciernagas Preschool at 2095 Harrison Street is approximately 745 feet west.

These above-noted sensitive receptors were not evaluated separately from residences because the residences are closer to the project site and are assumed to include children of comparable ages who would be exposed to higher pollutant concentrations for a longer duration than the daycare and middle school facilities, and are therefore expected to have greater health impacts. The analysis also assumes residents are at their residences and exposed to the project's emissions for 30 years, as recommended by California Office of Environmental Health Hazard Assessment (OEHHA) health risk guidelines.

As stated on p. 3.E.14, the project site is located within an area that meets the APEZ criteria and is also located within a heath vulnerable ZIP code. Background cancer risk values on the project site are between about 144 and 178 in a million, with background values ranging from about 107 to 450 in 1 million within 1,000 feet of the site.[38] Background $PM_{2.5}$ concentrations range from about 9.9 to 11.5 $\mu g/m^3$ on the project site, with background values varying between about 9.2 to 16.9 $\mu g/m^3$ within 1,000 feet of the site.

EXISTING STATIONARY SOURCES OF AIR POLLUTION

The air district's inventory of permitted stationary sources of emissions shows approximately eight permitted stationary emission sources within or near the 1,000-foot zone of influence[39] of the project site. These sources include gasoline dispensing facilities, auto body coating, sterilizers, spray booths, a clay kiln, and a coffer roster. Of these sources, emissions from the gasoline

[38] San Francisco Department of Public Health, 2020, APEZ 2020 Geodatabase.

[39] For assessing community risks and hazards, an area of influence, i.e., a 1,000-foot radius distance buffer around the project site boundary, is recommended. The air district recommends that any proposed project that includes the siting of a new emissions source assess associated impacts to sensitive receptors within 1,000 feet.

dispending facilities result in the largest estimated cancer risk and $PM_{2.5}$ concentrations in the project vicinity. All of these sources contribute to the background levels of cancer risk and $PM_{2.5}$ concentration discussed on p. 3.E.14.

MAJOR ROADWAYS CONTRIBUTING TO AIR POLLUTION

U.S. 101 is the only freeway or major roadway within 1,000 feet of the project site with more than 30,000 vehicles in annual average daily traffic, based on data provided by the BAAQMD.[40] This traffic contributes to concentrations of $PM_{2.5}$, DPM, and other air contaminants emitted from motor vehicles near the street level. Aside from the surrounding major roadways, there are no other areas of mobile-source activity or otherwise "non-permitted" sources (e.g., railyards, trucking distribution facilities, and high-volume fueling stations) located within 1,000 feet of the project site.

REGULATORY FRAMEWORK

FEDERAL REGULATIONS

Federal Clean Air Act

The 1970 Clean Air Act (last amended in 1990) requires that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants are planned to be controlled in order to achieve all standards by the deadlines specified in the act. These ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an ample margin of safety) to which the public can be exposed without adverse health effects. They are designed in consideration of those segments of the public most susceptible to respiratory distress, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above ambient air quality standards without observing adverse health effects.

The current attainment status for the San Francisco Bay Area Air Basin, with respect to federal standards, is summarized in **Table 3.E.2**, pp. 3.E.7-3.E.8. In general, the air basin experiences low concentrations of most pollutants when compared to federal standards, except for ozone and PM (PM_{10} and $PM_{2.5}$) for which standards are exceeded periodically (see **Table 3.E.1**, p. 3.E.4).

[40] BAAQMD, 2019 Raster files with health risk values modeled for all highways/freeways and roadways with over 30,000 AADT, May 6, 2020.

Emission Standards for New Off-Road Equipment

Before 1994, there were no standards to limit the amount of emissions from off-road equipment, which includes construction equipment. In 1994, the U.S. EPA established emission standards for hydrocarbons, NOx, CO, and PM to regulate new pieces of off-road equipment. These emission standards came to be known as Tier 1. Since that time, increasingly more stringent Tier 2, Tier 3, and Tier 4 (interim and final) standards were adopted by the U.S. EPA, as well as by the air resources board. Each adopted emission standard was phased in over time. New engines built in and after 2015 across all horsepower sizes must meet Tier 4 final emission standards. In other words, new manufactured engines cannot exceed the emissions established for Tier 4 final emissions standards.

STATE REGULATIONS

California Clean Air Act

Although the Federal Clean Air Act established national ambient air quality standards, individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological problems in California, there is considerable diversity between the state and national ambient air quality standards, as shown in **Table 3.E.2**, pp. 3.E.7-3.E.8. California ambient standards are at least as protective as national ambient standards and are often more stringent.

In 1988, California passed the California Clean Air Act (California Health and Safety Code sections 39600 et seq.), which, like its federal counterpart, required the designation of areas as attainment or non-attainment, but based these designations on state ambient air quality standards rather than the federal standards. As indicated in **Table 3.E.2**, the San Francisco Bay Area Air Basin is designated as "non-attainment" for state ozone, PM_{10}, and $PM_{2.5}$ standards, and as "attainment" or "unclassified" for other pollutants.

Toxic Air Contaminants

In 2005, the air resources board approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles. The regulations generally limit idling of commercial motor vehicles (including buses and trucks) within 100 feet of a school or residential area for more than five consecutive minutes or periods aggregating more than five minutes in any one hour. Buses or vehicles also must turn off their engines upon stopping at a school and must not turn their engines on more than 30 seconds before beginning to depart from a school. Also, state law Senate Bill 352 was adopted in 2003 and limits locating public schools within 500 feet of a freeway or busy traffic corridor (Education Code section 17213; Public Resources Code section 21151.8).

Tanner Air Toxics Act and Air Toxics Hot Spots Information and Assessment Act

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Assembly Bill 2588), also known as the Hot Spots Act. To date, the air resources board has identified more than 21 TACs and has adopted the U.S. EPA's list of hazardous air pollutants as TACs.

California Air Resources Board's In-Use Off-Road Diesel-Fueled Fleets Regulation

In 2007, the air resources board adopted a regulation to reduce diesel PM and NOx emissions from in-use off-road heavy-duty diesel vehicles in California.[41] The regulation imposes limits on vehicle idling and requires fleets to reduce emissions by retiring, replacing, repowering, or installing exhaust retrofits on older engines. In December 2010, major amendments were made to the regulation, including a delay of the first performance standards compliance date to no earlier than January 1, 2014.

Title 24 (Building Energy Efficiency Standards)

Title 24 of the California Code of Regulations is the means by which California regulates energy consumption. The Title 24 Building Energy Efficiency Standards apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and nonresidential buildings. The Title 24 standards, first adopted by the California Energy Commission in 1978, are updated periodically to incorporate new energy efficiency technologies and methods.

The California Green Building Standards Code was adopted as part of Title 24 in 2008 and was last updated in 2019. The code establishes voluntary standards for planning and design for energy efficiency (in excess of the California Energy Code requirements), water efficiency and conservation, material conservation and resource efficiency, sustainable site development, and internal air contaminants and more.

The California Energy Code (Title 24, Part 6, Building Energy Efficiency Standards, effective January 1, 2020)[42] includes the 2019 Energy Standards which focus on three key areas: residential photovoltaic systems, residential and nonresidential ventilation requirements, and nonresidential lighting requirements. For ventilation, the updates will increase air filtration requirements to a Minimum Efficiency Reporting Value (MERV) of 13, necessary for filtering out the smallest category of potentially harmful particulates. This filtration requirement applies to all habitable

[41] California Code of Regulations, title 13, sections 2449, 2449.1, 2449.2, and 2449.3.
[42] California Energy Commission, 2019 Building Energy Efficiency Standards, 2019, *https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf*, accessed September 20, 2020.

spaces in high-rise residential buildings[43], hotel/motel buildings, and nonresidential buildings other than healthcare facilities that are mechanically heated or mechanically cooled.

The filtration requirement reduces indoor exposure to particulate matter including DPM and thus will reduce cancer risk to occupants of applicable buildings for which an application for a building permit or renewal of an existing permit is filed after January 1, 2020.

California Green Buildings Standards Code (CALGreen)

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24 California Code of Regulations). The 2019 California Green Building Standards Code (24 California Code of Regulations, Part 11), also known as the CALGreen Code, contains mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools, and hospitals) throughout California. The development of the CALGreen Code is intended to reduce energy and water consumption, reduce construction waste, make buildings more efficient in the use of materials and energy, and reduce environmental impacts during and after construction.

The CALGreen Code provides standards for bicycle parking, carpool/vanpool/electric vehicle spaces, light and glare reduction, grading and paving, energy efficient appliances, renewable energy, graywater systems, water efficient plumbing fixtures, recycling and recycled materials, pollutant controls (including moisture control and indoor air quality), acoustical controls, storm water management, building design, insulation, flooring, and framing, among others.

REGIONAL REGULATIONS AND PLANS

Bay Area Air Quality Management District

The Bay Area Air Quality Management District is the regional agency with jurisdiction over the nine-county region located in the San Francisco Bay Area Air Basin. The Association of Bay Area Governments, Metropolitan Transportation Commission (MTC), county transportation agencies, cities and counties, and various non-governmental organizations also participate in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs. The air district is responsible for attaining and maintaining air quality in the region within federal and state air quality standards. Specifically, the air district has the responsibility to monitor ambient air pollutant levels throughout the region and to develop and implement strategies to attain the applicable federal and state standards.

[43] A high-rise residential building is defined as a building, other than a hotel/motel, of Occupancy Group R-2 or R-4 with four or more habitable stories.

The air district does not have authority to regulate emissions from motor vehicles. Specific rules and regulations adopted by the air district limit the emissions that can be generated by various stationary sources and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants, but TAC emissions sources are also subject to these rules and are regulated through the district's permitting process and standards of operation.

Through this permitting process, including an annual permit review, the air district monitors the generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the proposed project would be subject to the air district's Rules and Regulations. Both federal and state ozone plans rely heavily on stationary source control measures set forth in the air district's Rules and Regulations.

A list of some of the applicable air district rules is provided below:

- **Regulation 2, Rule 2 (New Source Review)**: This regulation contains requirements for best available control technology and emissions offsets.
- **Regulation 2, Rule 5 (New Source Review of TACs)**: This regulation outlines guidance for evaluating TAC emissions and their potential health risks.
- **Regulation 6, Rule 1 (Particulate Matter)**: This regulation restricts emissions of particulate matter darker than No. 1 on the Ringlemann Chart to less than three minutes in any one hour.
- **Regulation 7 (Odorous Substances)**: This regulation establishes general odor limitations on odorous substances and specific emissions limitations on certain odorous compounds.
- **Regulation 8, Rule 3 (Architectural Coatings)**: This regulation limits the quantity of VOCs in architectural coatings.
- **Regulation 9, Rule 8 (Stationary Internal-Combustion Engines)**: This regulation limits emissions of NOx and CO from stationary internal-combustion engines of more than 50 horsepower (hp).
- **Regulation 11, Rule 2 (Hazardous Pollutants)**: This regulation limits emissions of asbestos during demolition, renovation, milling, and manufacturing and establishes appropriate waste disposal procedures.

In accordance with its Engineering Division Policy and Procedure Manual,[44] the air district requires implementation of best available control technology for toxics and would deny an authority to construct or a permit to operate for any new or modified source of TACs that exceeds a cancer risk of 10 in 1 million or a chronic or acute hazard index of 1.0. The permitting process under the air district's Regulation 2, Rule 5 requires a health risk screening analysis, the results of which are posted on the air district's website.

[44] BAAQMD, Engineering Division Policy and Procedure Manual, September 2015, *http://www.baaqmd.gov/~/media/files/engineering/policy_and_procedures/engineering-policy-and-procedure-manual.pdf?la=en*, accessed May 5, 2021.

The air district regulates back-up emergency generators, fire pumps, and other sources of TACs through its New Source Review (Regulation 2, Rule 5) permitting process.[45] Although emergency generators are intended to be used only during periods of power outages, monthly testing of each generator is required; however, the air district limits testing to no more than 50 hours per year. Each emergency generator installed is assumed to meet a minimum of Tier 2 emission standards (before control measures). As part of the permitting process, the air district limits the excess cancer risk from any facility to no more than 10 per 1 million population for any permits that are applied for within a two-year period and would require any source that would result in an excess cancer risk greater than 1 per 1 million to install Best Available Control Technology for Toxics.

Several air district regulations and rules apply to odorous emissions. Regulation 1, rule 301 is a nuisance provision that states that sources cannot emit air contaminants that cause nuisance to a considerable number of persons. Regulation 7 specifies limits for the discharge of odorous substances where the air district receives complaints from 10 or more complainants within a 90-day period.

Bay Area Air Quality Planning Relative to State and Federal Standards

FEDERAL AIR QUALITY PLAN

Air quality plans developed to meet federal requirements are referred to as State Implementation Plans. The federal and state clean air acts require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM_{10} standard). The BAAQMD adopted the Bay Area Ozone Attainment Plan in 2001 in response to U.S. EPA's finding that the Bay Area had failed to attain the national ambient air quality standard for ozone. The plan includes a control strategy for ozone and its precursors to ensure a reduction in emissions from stationary sources, mobile sources, and the transportation sector.[46]

CALIFORNIA AIR QUALITY PLAN

Bay Area plans addressing state standards are prepared with the cooperation of BAAQMD, the MTC, and the Association of Bay Area Governments (ABAG). In April 2017, the air district adopted the 2017 Bay Area Clean Air Plan[47] whose primary goals are to protect public health and

[45] BAAQMD, Regulation 2, Permits; Rule 5, New Source Review of Toxic Air Contaminants, December 2016, *https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-rule-5-new-source-review-of-toxic-air-contaminants/documents/rg0205_120716-pdf.pdf?la=en*, accessed May 5, 2021.

[46] BAAQMD, Revised San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard, adopted October 24, 2001, *http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2001-ozone-attainment-plan/oap_2001.pdf*, accessed May 5, 2021.

[47] BAAQMD, 2017 Bay Area Clean Air Plan: Spare the Air, Cool the Climate. A Blueprint for Clean Air and Climate Protection in the Bay Area, April 19, 2017, *http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en,* accessed May 5, 2021.

to protect the climate. The plan includes a wide range of proposed control measures to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. The 2017 Bay Area Clean Air Plan updates the 2010 Bay Area Clean Air Plan and complies with state air quality planning requirements as codified in the California Health and Safety Code. The San Francisco Bay Area Air Basin is designated nonattainment for both the one- and eight-hour state ozone standards. In addition, emissions of ozone precursors in the air basin contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the Clean Air Plan to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins.

The 2017 Bay Area Clean Air Plan contains 85 measures to address reduction of several pollutants: ozone precursors, particulate matter, air toxics, and/or GHGs. Other measures focus on a single type of pollutant, potent GHGs such as methane and black carbon, or harmful fine particles that affect public health. These control strategies are grouped into the following categories:

- Stationary Source Measures
- Transportation Control Measures
- Energy Control Measures
- Building Control Measures
- Agricultural Control Measures
- Natural and Working Lands Control Measures
- Waste Management Control Measures
- Water Control Measures
- Super-GHG Control Measures

To fulfill federal air quality planning requirements, the air district adopted a $PM_{2.5}$ emissions inventory for year 2010 at a public hearing on November 7, 2012. The 2017 Bay Area Clean Air Plan also included several measures for reducing PM emissions from stationary sources and wood burning. On January 9, 2013, the U.S. EPA issued a final rule determining that the Bay Area has attained the 24-hour $PM_{2.5}$ national ambient air quality standard, suspending federal State Implementation Plan planning requirements for the San Francisco Bay Area Air Basin.[48] Despite this U.S. EPA action, the air basin will continue to be designated as non-attainment for the national 24-hour $PM_{2.5}$ standard until the air district submits a redesignation request and a maintenance plan to the U.S. EPA, and the U.S. EPA approves the proposed redesignation.

[48] U.S. EPA, Determination of Attainment for the San Francisco Bay Area Nonattainment Area for the 2006 Fine Particle Standard; California; Determination Regarding Applicability of Clean Air Act Requirements, January 9, 2013, *https://www.federalregister.gov/documents/2013/01/09/2013-00170/determination-of-attainment-for-the-san-francisco-bay-area-nonattainment-area-for-the-2006-fine*, accessed May 5, 2021.

Association of Bay Area Governments and Metropolitan Transportation Commission Plan Bay Area

On July 18, 2013, the MTC and ABAG approved Plan Bay Area. Plan Bay Area includes integrated land use and transportation strategies for the region and was developed through OneBayArea, a joint initiative between ABAG, the air district, the MTC, and the San Francisco Bay Conservation and Development Commission. The plan's transportation policies focus on maintaining the extensive existing transportation network and using these systems more efficiently to handle density in Bay Area transportation cores.[49] Assumptions for land use development are from local and regional planning documents. Emission forecasts in the 2017 Bay Area Clean Air Plan rely on projections of vehicle miles traveled, population, employment, and land use projections made by local jurisdictions during development of Plan Bay Area.

In July 2017, the MTC and ABAG adopted Plan Bay Area 2040. The updated plan addresses housing and economic issues and provides strategies to address the area's transportation and land use goals. The plan's land use and transportation pattern achieve the two mandated requirements for a reduction in per-capita CO_2 emissions from passenger vehicles and adequate housing for the Bay Area's expected population growth through 2040.[50] In spring 2018 the MTC and ABAG initiated the planning process for the update to the 2017 plan: Plan Bay Area 2050.[51] This update outlines the strategic framework for growth and investment through 2050 using the recently adopted 2020 Regional Growth Forecast.[52] Plan Bay Area 2050 includes 35 strategic transportation, housing, economic, and environmental policy initiatives and/or investment strategies to sustainably guide the region to 2050. The impacts of the plan's proposed regional pattern of household and employment growth, transportation investments, and resilience investments will be assessed as part of a program-level environmental review.[53] The Notice of Preparation for the Draft EIR for Plan Bay Area 2050 (Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area) was published on September 28, 2020, initiating a 30-day review

[49] Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area: Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area, 2013-2040, adopted July 18, 2013, *https://mtc.ca.gov/our-work/plans-projects/plan-bay-area-2040/plan-bay-area*, accessed May 5, 2021.

[50] Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2040: Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area, 2017–2040, adopted July 26, 2017, *https://www.planbayarea.org/plan-bay-area-2040*, accessed May 12, 2021.

[51] Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2050, *https://www.planbayarea.org/plan-bay-area-2050-1*, accessed December 3, 2020.

[52] The 2020 regional growth forecast identifies how much the Bay Area might grow between Plan Bay Area 2050's baseline year (2015) and its horizon year (2050), including population, jobs, households and associated housing units.

[53] Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2050, 2050 Plan, Environmental Impact Report, *https://www.planbayarea.org/draftEIR*, accessed June 25, 2021.

period that ended on October 28, 2020. A public scoping meeting was held on October 15, 2020. The Draft EIR is anticipated to be released in late spring/early summer 2021 with certification of the Final EIR in fall 2021.

LOCAL REGULATIONS AND PLANS

San Francisco General Plan Air Quality Element

The San Francisco General Plan (general plan) includes the 1997 Air Quality Element.[54] The objectives specified by the City include the following:

Objective 1: Adhere to state and federal air quality standards and regional programs.

Objective 2: Reduce mobile sources of air pollution through implementation of the Transportation Element of the General Plan.

Objective 3: Decrease the air quality impacts of development by coordination of land use and transportation decisions.

Objective 4: Improve air quality by increasing public awareness regarding the negative health effects of pollutants generated by stationary and mobile sources.

Objective 5: Minimize particulate matter emissions from road and construction sites.

Objective 6: Link the positive effects of energy conservation and waste management to emission reductions.

San Francisco Construction Dust Control Ordinance

Dust can be an irritant that causes watery eyes or lung, nose, or throat irritation. Demolition, excavation, grading, and other construction activities can cause wind-blown dust, which could contribute particulate matter to the local atmosphere. Depending on exposure, adverse health effects can result from this particulate matter in general as well as specific contaminants, such as lead or asbestos, which may be constituents of the soil. In response, the City adopted San Francisco Health Code article 22B[55] and San Francisco Building Code section 106.A.3.2.6[56], which collectively constitute the Construction Dust Control Ordinance. San Francisco Public Works (public works) has incorporated similar provisions in the San Francisco Building Code into public works order No. 171,378.[57] The ordinance requires that all site preparation work, demolition, or

[54] San Francisco Planning Department, Air Quality Element of the *San Francisco General Plan*, July 1997, updated in 2000.

[55] San Francisco Department of Public Health, Article 22B: Construction Dust Control Requirements, July 2008, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_health/0-0-0-4199*, accessed December 3, 2020.

[56] San Francisco Department of Building Inspections, Building Code section 106.A.3.2.6, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_building/0-0-0-92027*, accessed December 3, 2020.

[57] San Francisco Public Works, Order No. 171,378, November 18, 1998, *http://sfpublicworks.org/sites/default/files/Public%20Works%20Order%20171%2C378.pdf*, accessed December 3, 2020.

other construction activities within San Francisco that have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil comply with specified dust control measures whether or not the activity requires a permit from the Department of Building Inspection. For projects over 0.5 acre, the Construction Dust Control Ordinance requires that the SFMTA and private project co-sponsor submit a dust control plan for approval by the San Francisco Department of Public Health prior to issuance of a building permit by the Department of Building Inspection.

Construction permits will not be issued without written notification from the Director of Public Health stating that the SFMTA and private project co-sponsor has a site-specific dust control plan unless the director waives the requirement. The Construction Dust Control Ordinance requires SFMTA and private project co-sponsor and contractors responsible for construction activities to control construction dust on the site or implement other practices that result in equivalent dust control that are acceptable to the Director of Public Health.

Dust suppression activities may include watering all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by article 21, section 1100 et seq. of the San Francisco Public Works Code.

San Francisco Clean Construction Ordinance

In April 2007, the City adopted an ordinance requiring public projects to reduce emissions at construction sites starting in 2009. In March 2015, the City expanded the existing ordinance to require public projects to reduce emissions at construction sites in areas with high background concentrations of air pollutants. Establishment of the APEZ was used as the basis for approving a series of amendments to the San Francisco Environment and Administrative codes, generally referred to as the Clean Construction Ordinance, or Environment Code chapter 25 (Ordinance 28-15, effective April 19, 2015).[58] The purpose of the Clean Construction Ordinance is to protect the public health, safety, and welfare by requiring contractors on City projects to reduce diesel and other particulate matter emissions generated by construction activities. For projects located within a mapped APEZ, such as the proposed project or project variants, the Clean Construction Ordinance requires the items listed below.

Equipment Requirements

- Equipment must meet or exceed Tier 2 standards for off-road engines and operate with the most effective California Air Resources Board Verified Diesel Emissions Control Strategy (VDECS) available for the engine type (Tier 4 engines automatically meet this requirement).

[58] City and County of San Francisco, Clean Construction Ordinance, August 2015, *https://www.sfdph.org/dph/files/EHSdocs/AirQuality/San_Francisco_Clean_Construction_Ordinance_2015.pdf*, accessed December 4, 2020.

- Portable diesel engines are prohibited where access to alternative sources of power is available.
- Idling of off-road and on-road equipment is limited to two minutes at any location, except as provided in applicable state regulations (e.g., traffic conditions, safe operating conditions). The contractor must post legible and visible signs in English, Spanish, and Chinese in designated queuing areas and at the construction site to remind operators of the two-minute idling limit.
- *Construction Emissions Minimization Plan*. A Construction Emissions Minimization Plan must be prepared before the start of construction. The plan is required to include estimates of the construction timeline by stage and a description of each piece of off-road equipment required for every construction stage (e.g., equipment type, manufacturer, identification number, model year, tier rating, horsepower, expected fuel usage, hours of operation). Additional details may be included for VDECS (e.g., technology type, serial number, make, model, manufacturer, California Air Resources Board verification number level). For off-road equipment using alternative fuels, the description must specify the type of alternative fuel being used.
- *Monitoring*. Monitoring and reporting actions are required during construction to document compliance with the ordinance.
- *Waivers*. Waivers to the requirements of the Clean Construction Ordinance can be issued under unusual circumstances (e.g., lack of available qualifying equipment).

San Francisco Health Code Provisions for Urban Infill Development (Article 38)

San Francisco adopted article 38 of the San Francisco Health Code (health code) in 2008, with revisions that took effect in December 2014. The revised code requires that sensitive land use developments within mapped APEZs incorporate MERV 13 or equivalent ventilation systems to remove particulates from outdoor air.[59] This regulation also applies to conversion of uses to a sensitive use (such as a residential use, a senior care facility, or a daycare center). Article 38 is applicable to the proposed project because the project proposes sensitive land uses and is located within a mapped APEZ.[60]

San Francisco Public Works Standard Construction Measures

As discussed in **EIR Chapter 2, Project Description**, p. 2.49, public works' Standard Construction Measures (SCMs) would apply to the proposed project or project variants (see **Table 2.3: San Francisco Public Works Standard Construction Measures**, pp. 2.50-2.53). The

[59] The MERV rating is a measurement scale designed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to rate the effectiveness of air filters. The scale is designed to represent the worst-case performance of a filter when dealing with particles in the range of 0.3 to 10 micrometers. The MERV rating system ranges from 1 to 16, with higher MERV ratings correspond to a greater percentage of particles captured on each pass.

[60] San Francisco Planning Department, Property Information Map, Air Pollution Exposure Zone (2020), *https://sfplanninggis.org/pim/map.html?search=2500%20Mariposa%20street&layers=Air%20Pollutant%20Exposure%20Zone*, accessed May 5, 2021.

SFMTA and private project co-sponsor (the project sponsor team) would implement public works' SCMs as part of the proposed project or project variants, including the measures applicable to air quality. **SCM #2, Air Quality**, requires all projects to comply with the Construction Dust Control Ordinance, as described above on pp. 3.E.28-3.E.29. Major projects with more than 20 days of construction within a mapped APEZ such as the proposed project or project variants must also comply with the Clean Construction Ordinance, as described above on pp. 3.E.29-3.E.30. Also refer to **EIR Appendix C** for additional information on public works' **SCM #2, Air Quality**.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, which has been modified by the San Francisco Planning Department. For this analysis, the following thresholds were used to determine whether implementing the proposed project or project variants would result in a significant impact related to air quality.

A project would have a significant effect on air quality if implementation of the project would do any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

APPROACH TO ANALYSIS

Project Features

In general, the proposed project or project variants would generate emissions of criteria air pollutants, ozone precursors, and TACs during construction and operations. All project construction activities would be completed prior to operation; therefore, there will be no overlap between project construction emissions and emissions occurring during project operations.

Proposed Construction

During construction, air quality impacts could result from operation of heavy-duty construction equipment, vehicle trips made by construction workers, truck hauling trips, and vendor truck trips. In addition, fugitive dust emissions would result from site disturbance, including grading and

asphalt recycling, and fugitive ROG emissions would result from application of architectural coatings and paving.

For purposes of the construction air quality analysis, the proposed project or project variants was assumed to be constructed over a period of three years. Demolition would last about two months and site preparation, grading, and piling would last about five months. Installation of the foundation system would last about two months. Above-ground building construction, exterior finishing, and interior finishing would take a total of about 27 months, with some work overlap. Mobile equipment, such as excavators, graders, backhoes, loaders, dump trucks, forklifts, compactors, pavers, and cranes, would be used for demolition, site clearing, excavation, and grading, but also for building construction and/or hardscape and landscape materials installation. Miscellaneous stationary equipment would include generators, air compressors, and cement/mortar mixers. A variety of other smaller mechanical equipment would also be used at the project site during the construction period, such as jackhammers/pavement breakers, concrete/industrial saws cutters, impact drills, and concrete boom pumps. The proposed project or project variants would require pile driving. A list of construction equipment expected to be used for the proposed project or project variants by construction activity is shown in **EIR Appendix G-1, Air Quality and Health Risk Assessment Methodology**. The preliminary off-road construction equipment list (equipment roster by type, fuel use, and number) and assumed intensity of daily use of each type of off-road construction equipment provided by the SFMTA are estimates. There is a level of uncertainty, and these numbers may change as the project evolves and the private project co-sponsor provides detailed plans and/or any project refinements.

Construction-related activities would typically occur Monday through Saturday, between 7 a.m. and 8 p.m. as allowed in San Francisco, with most work occurring between Monday and Friday. Nighttime construction is anticipated for certain activities such as major concrete pours; however, construction on Sundays and major legal holidays is not anticipated. Throughout the construction period, construction staging would occur on site and on the surrounding sidewalks except for the first 12 months when the north side parking lane and westbound travel lane on Mariposa Street between Bryant and Hampshire streets would be closed to provide additional space for construction staging. Additionally, Hampshire Street between 17th and Mariposa streets would be partially closed on a temporary, as-needed basis to provide additional space for laydown and staging.

Project construction would also generate truck trips delivering concrete and other building materials, transporting construction equipment to and from the site, hauling soils and debris from the site, and for sweeping streets as part of construction site management and dust control.

Proposed Operation

Operation of the proposed project or project variants would begin as early as 2026. The proposed project or project variants would generate operational emissions from a variety of sources,

including stationary sources (diesel emergency generators), area sources (consumer products, architectural coatings, and landscape equipment), and mobile sources (daily automobile and truck trips). The proposed project or project variants would not use natural gas and therefore would not include any natural gas-powered process boilers.

The proposed replacement transit facility would operate 24 hours per day, 7 days a week. Other key operational elements of the proposed project or project variants that could directly or indirectly result in air quality impacts include the following:

- Traffic increases would be associated with long-term development and would result in 3,208 daily and 226 weekday p.m. peak hour vehicle trips over existing conditions.[61]
- The proposed replacement transit facility would continue to use solvents for bus cleaning activities in accordance with the emission limitations described under the facility's existing BAAQMD Permit to Operate[62] (i.e., no net change in permissible solvent emissions is proposed or required).[63]
- The proposed replacement transit facility would include operation of two emergency diesel generators with a maximum power of about 1,000 kilowatts.
- Backup power for the proposed residential component of the joint development would include one emergency diesel generator with a maximum power of about 1,000 kilowatts.
- Other area sources would include consumer products, architectural coatings, and landscape equipment.
- Travel and idling emissions would be associated with daily delivery and service vehicle trips.

Additional information on the project's operational emissions sources is provided in **EIR Appendix G**.

The sustainability strategy of the SFMTA and private project co-sponsor would address onsite renewable energy capture as part of its Leadership in Energy and Environmental Design process, e.g., onsite solar photovoltaic systems. The proposed project or project variants would, at minimum, comply with the state's Title 24 energy efficiency requirements and the state Green Building Requirements (discussed above on p. 3.E.23). The proposed project or project variants would not include onsite parking aside from storage for SFMTA vehicles associated with the transit facility (213 buses and 97 non-revenue vehicles); all of which would be electric-powered vehicles. No parking would be provided for the SFMTA employees or for the commercial or residential land uses; however, the SFMTA and the private project co-sponsor would develop and implement a site-specific transportation demand management (TDM) program that would include measures to

[61] Fehr & Peers and LCW Consulting, Travel Demand Estimates for the Potrero Yard Modernization Project, August 12, 2020, Table 6 (see **EIR Appendix E-4**).
[62] Bay Area Air Quality Management District Permit to Operation, Plant #9427, San Francisco Municipal Railway Potrero.
[63] There are no other existing sources of TAC emissions at Potrero Yard.

reduce vehicle trips and encourage sustainable modes of transportation including the provision of 12 car-share spaces. The TDM program may include both physical (e.g., bicycle and car-share parking) and programmatic (e.g., incentives) measures. In effect, the TDM program would reduce operational air pollutant emissions by reducing the number of vehicle trips that would otherwise be generated by the project. Key strategies in the TDM program include improved walking conditions and bike lanes, car-share parking, and other approaches to discourage use of single-occupant private vehicles. However, the impact of the TDM program was not quantified in this EIR due to a lack of certainty as to measurable effectiveness of the trip reduction measures. Thus, the criteria pollutant emissions reflect the project's impact without implementation of the TDM program.

As discussed above, the project site is located within a mapped APEZ. Therefore, the proposed sensitive land uses (residential uses and possibly childcare under the Employee and Family Support Variant to the project, described below) would be required to comply with Health Code article 38, which requires MERV-13 air filtration for all sensitive use developments in the APEZ.

Project Variants

The analysis of the proposed project adequately addresses the air quality impacts from the project variants (summarized below and described in more detail in **EIR Chapter 2, Project Description**, pp. 2.56-2.58) because the variants are minor relocations and site programming changes which do not affect the building construction or operations. Therefore, air pollutant emissions and associated health risks from the construction and operation of the proposed variants are anticipated to be the same as those from the proposed project.

Emergency Exit Relocation Variant: Relocation of the proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street.

Joint Development Lobby Relocation Variant: Relocation of joint development lobby off Mariposa Street to Hampshire Street.

Active 17th Street Variant: Relocation of internal bus ramps from the north to south sides to allow the mix of joint development uses along 17th Street.

Employee and Family Support Variant: Site program revision to include childcare, or related use, in a portion of the space identified in the proposed project for ground-floor commercial use.

Methodology

In general, the proposed project would result in two types of potential air quality impacts. First, the project would result in air pollution through construction activity. Second, the project would generate air pollutants during project operations, due to increased vehicle travel and new stationary sources (i.e., up to three new emergency standby diesel generators). There would be no emissions overlap between project construction and project operations.

The impact analysis in this section was performed in accordance with the Air Quality and Health Risk Assessment Methodology prepared for the proposed project, which describes the methodology and assumptions for estimating criteria air pollutant emissions and TACs, and for assessing health risks during project construction and operations. The analysis assumes that requirements of public works' **SCM #2, Air Quality**, are included in construction contracts for the proposed project or project variants (see **EIR Appendix C**). A copy of the Air Quality and Health Risk Assessment Methodology, including the project-specific construction data, is provided in **EIR Appendix G-1**.

As described, the impact assessment employs the emission factors, models, and tools distributed by a variety of agencies, including the air resources board, the California Air Pollution Officers Association (CAPCOA), OEHHA, and U.S. EPA. Additionally, the analysis includes methods identified in the BAAQMD CEQA Air Quality Guidelines (May 2017). Additional detail on the project's construction and operational emissions sources is provided above under "Project Features."

The approach used to analyze the significance thresholds is discussed below.

Consistency with Air Quality Plan

The proposed project or project variants would be consistent with the 2017 Bay Area Clean Air Plan if it would support the plan's goals, incorporate applicable control measures into the project, and would not disrupt or hinder implementation of any control measures from the plan. Consistency with this plan is the basis for determining whether the proposed project or project variants would conflict with or obstruct implementation of an applicable air quality plan. This assessment addresses the first bulleted significance criterion identified above. See discussion under **Impact AQ-4**, pp. 3.E.60-3.E.63.

Regional and Local Air Quality Impacts

The proposed project or project variants would result in: (1) impacts from criteria air pollutant emissions, which are generally regional in nature, and (2) impacts associated with exposure to TACs and $PM_{2.5}$, which is a localized health impact expressed in terms of exposure to $PM_{2.5}$ annual average concentrations and the probability of contracting cancer per 100 in 1 million persons exposed to TAC concentrations. The assessment of criteria air pollutant impacts and localized health risk and exposure to $PM_{2.5}$ concentrations address the second and third bulleted significance criteria identified above.

CRITERIA AIR POLLUTANTS

As described above under "Regulatory Framework," p. 3.E.26, the San Francisco Bay Area Air Basin is designated as non-attainment for ozone, $PM_{2.5}$, and PM_{10}.

By definition, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of air quality standards. Instead, a project's individual emissions are considered to contribute to the existing, cumulative air quality conditions. If a project's contribution to cumulative air quality conditions is considerable, then the project's impact on air quality would be considered significant.[64] Given this, the impact analysis below does not include a separate cumulative criteria air pollutant impact discussion.

Table 3.E.5: Criteria Air Pollutant Significance Thresholds identifies quantitative criteria air pollutant significance thresholds. The table is followed by a discussion of each threshold. Projects that would result in criteria pollutant emissions above these significance thresholds would result in a cumulatively considerable net increase in non-attainment criteria air pollutants within the air basin (ozone precursors and PM). Both operational thresholds (average daily and maximum annual) apply to a given project. Construction emissions are assessed solely with respect to the average daily thresholds, pursuant to the air district's guidance, because of the generally temporary nature of construction-related emissions.[65]

The thresholds of significance for criteria air pollutants are based on substantial evidence presented in Appendix D of the 2017 BAAQMD CEQA Air Quality Guidelines and 2009 Revised Draft Options and Justification Report concerning CEQA thresholds.[66]

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[64] BAAQMD, CEQA Air Quality Guidelines, May 2017, *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en*, accessed May 5, 2021.
[65] BAAQMD, CEQA Air Quality Guidelines, May 2017, p. 8-2, *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en*, accessed May 5, 2021.
[66] BAAQMD, CEQA Air Quality Guidelines, May 2017, pp. 2-1 to 2-3 and Appendix D; BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, pp. 16-17.

Table 3.E.5: Criteria Air Pollutant Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (pounds/day)	Average Daily Emissions (pounds/day)	Maximum Annual Emissions (tons/year)
ROG	54	54	10
NOx	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
Fugitive Dust	Construction Dust Control Ordinance or other best management practices	Not Applicable	

Note: lb = pounds; NOx = nitrogen oxides; ROG = reactive organic gases; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter

Source: BAAQMD, CEQA Air Quality Guidelines, May 2017.

The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants that may contribute to an existing or projected air quality violation is based on the emissions limits for stationary sources set by the California and Federal Clean Air Acts. To ensure that new stationary sources do not cause or contribute to a violation of an air quality standard, the air district's Regulation 2, Rule 2 requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions. For ozone precursors ROG and NOx, the offset emissions level is an annual average of 10 tons per year (or 54 pounds per day).[67] These levels represent emissions below which new sources are not anticipated to result in a considerable net increase in criteria air pollutants.

The Federal New Source Review program was created under the Federal Clean Air Act to ensure that stationary sources of air pollution are constructed in a manner that is consistent with attainment of federal health-based ambient air quality standards. For PM_{10} and $PM_{2.5}$, the emissions limits under the New Source Review program are 15 tons per year (82 pounds per day) and 10 tons per year (54 pounds per day), respectively. These emissions limits represent levels below which a source alone is not expected to have a significant impact on air quality.[68]

Although the regulations specified above apply to new or modified stationary sources, land use development projects generate ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions due to increases in vehicle trips, energy use, architectural coating, and construction activities. Therefore, the identified thresholds can be applied to the construction and operational phases of land use projects. Those

[67] BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, p. 17.

[68] BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, p. 16.

projects that would result in emissions below these thresholds would not result in a cumulatively considerable net increase in nonattainment criteria air pollutants (ozone precursors or PM).

Fugitive dust emissions are typically generated during construction phases. Studies have shown that the application of best management practices at construction sites can significantly control fugitive dust,[69] and individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent.[70] The air district has identified eight best management practices to control fugitive dust emissions from construction activities.[71] San Francisco's Construction Dust Control Ordinance requires a number of fugitive dust control measures to ensure that construction projects do not result in visible dust. The project would be subject to the requirements of the Construction Dust Control Ordinance, which is the basis for determining the significance of air quality impacts from fugitive dust emissions.

OTHER CRITERIA POLLUTANTS

Regional concentrations of CO and SO_2 in the Bay Area have not exceeded the state standards for over two decades. The primary source of CO emissions from development projects is vehicle traffic. Construction-related SO_2 emissions represent a negligible portion of the total basin-wide emissions, and construction-related CO emissions represent less than 5 percent of the Bay Area total basin-wide CO emissions. As discussed previously, the Bay Area is in attainment for both CO and SO_2. Furthermore, the air district has demonstrated, based on modeling, that to exceed the California ambient air quality standard of 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited[72]). The transportation analysis indicates that the proposed project would generate 226 net-new vehicle trips during the weekday p.m. peak hour.[73] The existing weekday p.m. peak hour traffic volume at the roadway segment with the greatest traffic volumes (Potrero Avenue between 16th and 17th streets) is 1,677 vehicles per hour (see **EIR Appendix F-3**). Similar traffic increases would be associated with long-term development of the project variants except for the Employee and Family Support Variant which would result in 278 weekday p.m. peak hour vehicle trips over existing conditions (52 more weekday p.m. peak hour trips than the proposed project or other variants). Therefore, the existing plus project or project variants traffic volumes at nearby intersections would be well below the screening criterion of 44,000 vehicles per hour. Given the

[69] Western Regional Air Partnership, WRAP Fugitive Dust Handbook, September 7, 2006 .
[70] BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, p. 27.
[71] BAAQMD, CEQA Air Quality Guidelines, May 2011, p. 8-3.
[72] Such as a tunnel, underpass, or urban canyon between buildings where free flow of air currents can be impeded.
[73] Fehr & Peers and LCW Consulting, Travel Demand Estimates for the Potrero Yard Modernization Project, August 12, 2020, Table 6 (see **EIR Appendix E-4**).

Bay Area's attainment status and the limited CO and SO_2 emissions that could result from the proposed project or project variants, the proposed project or project variants would not result in a cumulatively considerable net increase in CO or SO_2, and a quantitative analysis is not required.

Local Health Risks and Hazards

In addition to criteria air pollutants, individual projects may emit TACs. The analysis of other toxic substances that may become airborne, such as naturally occurring asbestos, is presented in the initial study (see **EIR Appendix B**, **Section E.18, Hazards and Hazardous Materials**, **Impact HZ-2**, pp. 120-125).

As part of the environmental review for the proposed project and project variants, a health risk assessment was conducted to provide quantitative estimates of health risks from exposures to TACs. The results are summarized below and supporting calculations are detailed in **EIR Appendix G**. The health risk assessment examines all sensitive receptors within 1,000 feet of the project boundary. Air pollution dispersion modeling was used to identify areas with elevated air pollutant concentrations and higher exposures.

Exposure assessment guidance[74] establishes the assumption that people in residences would be exposed to air pollution 24 hours per day, 350 days per year, for 30 years as the basis for calculating cancer risk in any health risk assessment. Therefore, the assessment of air pollutant exposure to residents assumes residents are home all day most of the year for 30 years. This assumption typically results in the greatest adverse health outcomes of all population groups.

Additionally, in accordance with guidance from OEHHA,[75] the estimated excess lifetime cancer risk for a resident was adjusted using the age sensitivity factors recommended in the OEHHA Technical Support Document for Cancer Potency Factors.[76] This approach accounted for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates were weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age (labeled by OEHHA as "3rd trimester" and "0 < 2"), and by a factor of three for exposures that occur from two years through 15 years of age ("2 < 16"). No weighting factor (i.e., an age sensitivity factor of one, which is equivalent to no adjustment) was applied to ages 16 and

[74] Cal EPA, OEHHA, Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015, *http://www.oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf* and *https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf*, accessed May 5, 2021.

[75] Cal EPA, OEHHA, Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015, February 2015, Chapter 8, *http://www.oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf* and *https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf*, accessed May 5, 2021.

[76] Cal EPA, OEHHA, Technical Support Document for Cancer Potency Factors, May 2009, *https://oehha.ca.gov/air/crnr/technical-support-document-cancer-potency-factors-2009*, accessed May 5, 2021.

older. Therefore, the residential receptors are assumed to be infants when first exposed to construction period emissions.

The thresholds of significance used to evaluate health risks from new sources of TACs associated with construction and operation of the proposed project or project variants are based on the potential for the project to substantially increase the exposure of nearby sensitive receptors to TACs. As discussed previously on p. 3.E.14, the offsite receptors within 1,000 feet of the project site are within a mapped APEZ. Therefore, the project would be subject to significance thresholds that are lower (more stringent) than thresholds for projects located outside the APEZ. **Table 3.E.6: Health Risk Significance Thresholds** presents the health risk thresholds that are applied to projects within a mapped APEZ.

Table 3.E.6: Health Risk Significance Thresholds

Affected Sensitive Receptors	Significance Thresholds	
	Excess Cancer Risk (per million)	**$PM_{2.5}$ ($\mu g/m^3$)**
Project health risk contributions to sensitive receptor locations within the APEZ [NOTE A]	7.0	0.2

Notes: $PM_{2.5}$ = fine particulate matter; $\mu g/m^3$ = micrograms per cubic meter; APEZ = Air Pollutant Exposure Zone

[A] The air district identifies a project-level health risk threshold of an excess cancer risk of 10 per one million persons exposed and a $PM_{2.5}$ concentration of 0.3 $\mu g/m^3$. The planning department applies these more stringent (lower) thresholds for a project's contribution within the APEZ. A 0.2 $\mu g/m^3$ increase in $PM_{2.5}$ would result in a 0.28 percent increase in non-injury mortality or an increase of about 21 excess deaths per 1,000,000 population per year from non-injury causes in San Francisco. This information is based on Jerrett, M., et al., Spatial Analysis of Air Pollution and Mortality in Los Angeles, Epidemiology, 16:727-736, 2005. The excess cancer risk has been proportionally reduced to result in a significance criterion of 7 per 1 million persons exposed.

The health risk assessment evaluated the following receptor populations based on OEHHA 2015 guidelines for two scenarios, which are expected to have the highest impacts from the proposed project or project variants:

- **Scenario 1:** 30-year offsite residential exposure commencing at the start of proposed project construction and continuing through project operation; and
- **Scenario 2:** 30-year offsite residential exposure commencing at the time of project operation.

Under Scenario 1, offsite residential risks from construction emissions were added to residential risks associated with operational emissions from a combined total of 30 years of exposure, to ensure that the full impact of project construction and operation on nearby receptors was evaluated. Scenario 2 evaluated the impact on sensitive receptors from 30 years of exposure to operational emissions only (not construction of the proposed project). The 30-year exposure duration scenarios are consistent with OEHHA's guidance for evaluating cancer risk at the maximally exposed individual resident or receptor. Proposed onsite sensitive receptors, which include residents, and, under the Employee and Family Support Variant, a 9,000-gross-square-foot childcare facility,

would not be exposed to construction period emissions and would therefore experience lower levels of pollutant exposure than the offsite residents under Scenario 1. Under the Employee and Family Support Variant, the childcare use would be an additional on-site sensitive receptor and would be sited along Bryant Street near 17th Street.

Cumulative Impacts

As discussed above, the contribution of a project's individual air emissions to regional air quality impacts is, by its nature, a cumulative effect. Therefore, no separate cumulative criteria air pollutant impact analysis is provided.

Similarly, the health risk assessment considers the cumulative contribution of localized health risks to sensitive receptors from sources included in the citywide health risk modeling plus the proposed project's sources. Additionally, cumulative projects, whose emissions have not been incorporated into the existing citywide health risk modeling, are also taken into consideration in the cumulative health risk assessment. However, unlike criteria air pollutants, health risks are localized impacts in that beyond 1,000 feet from an emission source, pollutant levels tend to return to background levels. Thus, cumulative health risks to nearby sensitive receptors were assessed based on existing and future foreseeable emissions sources within 1,000 feet of the project's maximally exposed individual resident. The health risk significance thresholds are presented in **Table 3.E.6**, p. 3.E.40.

Odor Impacts

This analysis evaluates whether the proposed project or project variants would create objectionable odors that would affect a substantial number of people (e.g., by introducing new land uses that are typically associated with odor complaints). The BAAQMD's 2017 CEQA Guidelines provide guidance, in the form of screening distances, to help evaluate potential odor impacts. They identify potential odor sources of particular concern, such as wastewater treatment plants, oil refineries, asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations, and metal smelters, and recommend buffer zones around them to avoid potential odor conflicts. The assessment of potential odor impacts addresses the fourth bulleted significance criterion identified above.

IMPACT EVALUATION

Impact AQ-1: During construction, the proposed project or project variants would not generate significant fugitive dust emissions, but would generate criteria air pollutant emissions at levels which would result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment. ***(Less than Significant with Mitigation)***

Project construction activities would generate emissions of ozone precursors (ROG and NOx), PM_{10}, and $PM_{2.5}$ from off-road construction equipment, on-road vehicles (worker vehicles, vendor

trucks, concrete trucks, and haul trucks), and off-gassing from architectural coatings and asphalt paving. As discussed on pp. 3.E.1-3.E.2, a three-year construction period was used to provide a conservative (worst-case) analysis of average daily pollutant emissions. The preliminary construction program is described in **EIR Chapter 2, Project Description**, pp. 2.54-2.56, and a summary of the project-specific construction information is provided in **EIR Appendix G-2, Construction Criteria Air Pollutant Calculations and Supporting Documentation, Table G-2.3: Preliminary Project-Specific Construction Information**.

Fugitive Dust

Project-related demolition, excavation, grading, and other construction activities may cause wind-blown dust that could contribute PM to the local atmosphere. Despite the established federal standards for air pollutants and ongoing implementation of state and regional air quality control plans, air pollutants continue to have impacts on human health throughout the country.

Dust can be an irritant causing watering eyes or irritation to the lungs, nose, and throat. Depending on exposure, adverse health effects can occur due to PM in general as well as specific contaminants, such as lead or asbestos that may be constituents of dust.

In response to these concerns, the San Francisco Board of Supervisors approved a series of amendments to the San Francisco Building and Health Codes, generally referred hereto as the Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008), with the intent of reducing the quantity of dust generated during site preparation, demolition, and overall construction work in order to protect the health of the general public and onsite workers; to minimize public nuisance complaints; and to avoid orders to stop work by the Department of Building Inspection (building department). The building department will not issue a construction permit without written notification from the Director of Public Health that the applicant has an approved site-specific dust control plan.

In accordance with the Construction Dust Control Ordinance and public works' **SCM #2, Air Quality**, the SFMTA and private project co-sponsor will prepare a site-specific construction dust control plan for the 4.4-acre site for approval by the San Francisco Department of Public Health. Because the project site is within 1,000 feet of sensitive receptors, the site-specific dust control plan submitted to the Director of Public Health is required to include a map showing sensitive receptor locations. This plan also must contain the following measures specified in section 106.3.2.6.3 of the building code: designate an individual who will be responsible for monitoring compliance with dust control requirements; water all active construction areas sufficiently to prevent dust from becoming airborne, use reclaimed water whenever possible; during excavation and dirt-moving activities, wet sweep or vacuum streets and sidewalks where work is in process; cover any inactive stockpiles; and use dust enclosures, curtains, and dust collectors as necessary.

In addition, the site-specific dust control plan may require the SFMTA and private project co-sponsor to wet down areas of soil at least three times per day; provide an analysis of wind direction and install upwind and downwind particulate dust monitors; record particulate monitoring results; hire an independent, third-party to conduct inspections and keep a record of those inspections; establish shut-down conditions (based on wind, soil migration, etc.); establish a hotline for surrounding community members who may be potentially affected by project-related dust; limit the area subject to construction activities at any one time; install dust curtains and windbreaks at the property lines, as necessary; limit the amount of soil in hauling trucks to the size of the truck bed and securing with a tarpaulin; enforce a 15-mile-per-hour speed limit for vehicles entering and exiting construction areas; sweep affected streets with water sweepers at the end of the day; install and use wheel washers to clean truck tires; terminate construction activities when winds exceed 25 miles per hour; and sweep off adjacent streets to reduce particulate emissions. Inactive stockpiles (where no disturbance occurs for more than 7 days) greater than 10 cubic yards or 500 square feet of excavated material, backfill material, import material, gravel, sand, road base, and soil must be covered with a 10-mil (0.01-inch) polyethylene plastic (or equivalent) tarp and braced down, or other equivalent soil stabilization techniques should be used. Reclaimed water must be used for dust suppression watering, when required by article 21, section 1100 et seq. of the San Francisco Public Works Code. Contractors must provide as much water as necessary to control dust (without creating run-off in any area of land clearing, and/or earth movement). The San Francisco Public Utilities Commission operates a recycled water fill station at the Southeast Water Pollution Control Plant, which provides recycled water at no charge.[77]

Implementation of dust control measures in compliance with the public works' **SCM #2, Air Quality**, and regulations and procedures set forth by the San Francisco Construction Dust Control Ordinance would ensure that potential dust-related construction air quality impacts of the proposed project or project variants would be less than significant.

Regarding asbestos, as discussed in **Section E.18, Hazards and Hazardous Materials**, of the initial study under **Impact HZ-2** (see pp. 120-125 of **EIR Appendix B**), naturally occurring asbestos is known to be present in the bedrock beneath the site. As required, excavation and site grading would be conducted in accordance with the site mitigation plan required pursuant to the Maher Ordinance (article 22A of the health code); the site-specific construction dust control plan, required pursuant to public works' **SCM #2** and the Construction Dust Control Ordinance (article 22B of the health code); and the Asbestos Dust Mitigation Plan, required pursuant to the state Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface

[77] City Ordinance 175-91 requires the use of non-potable water for soil compaction and dust control undertaken in conjunction with any construction or demolition project occurring within the boundaries of San Francisco unless permission is obtained from the San Francisco Public Utilities Commission.

Mining Operations.[78] Thus, based on the required adherence to local, regional, and state construction dust control best management practices, particularly those that pertain to naturally occurring asbestos, any effects associated with the naturally occurring asbestos would be less than significant.

Criteria Air Pollutants

Methodology – Construction Emissions

OFF-ROAD EQUIPMENT

Construction of the proposed project or project variants would rely on electrical-, propane-, and diesel-powered off-road equipment. Emissions from off-road construction equipment were estimated for each of the following phases of project construction: demolition; site preparation, grading, and pile-driving; foundation; building construction; paving; and architectural coating.

While the use of electrical power supply during construction may come from fossil fuel power plants that generate criteria air pollutants, these pollutant emissions would be associated with the individual power plant operations (which may not occur in the San Francisco air basin or even in the state) and not the proposed project or project variants. Power plants are existing stationary sources subject to air district and/or the U.S. EPA's permitting requirements to monitor and control pollutant emissions. Therefore, pollutant emissions associated with the use of offsite-generated electrical power during construction of the proposed project or project variants were not estimated. Use of diesel construction equipment would occur during each phase of construction. Propane construction equipment would also be used for several types of equipment (e.g., forklifts), which generates lower pollutant emissions than diesel; however, to simplify calculations and be conservative, all propane emissions were estimated as diesel emissions.

Emissions from off-road diesel equipment were estimated in accordance with methodologies presented in the air resources board's Off-Road Simulation Model and Summary of Off-Road Emissions Inventory Update and using data derived from the Off-Road Emissions Inventory Model and California Emissions Estimator Model version 2016.3.2 (CalEEMod 2016.3.2). In accordance with public work's **SCM #2, Air Quality**, and the San Francisco Clean Construction Ordinance, all off-road diesel equipment would be equipped with Tier 2 or higher engines and the most effective VDECS available for the engine type to reduce diesel exhaust emissions within a mapped APEZ. It should be noted that off-road propane equipment is not subject to the Clean Construction Ordinance. Consistent with public works' **SCM #2** and the Clean Construction Ordinance, construction emissions were estimated assuming that all off-road diesel equipment would be

[78] California Code of Regulations Title 17, Section 93105, *https://www.arb.ca.gov/toxics/atcm/asb2atcm.htm*, accessed September 20, 2020. Pursuant to the authority in California Health and Safety Code, Section 39666, the Bay Area Air Quality Management District enforces these standards.

equipped with engines certified to meet the U.S. EPA's Tier 2 emission standards and Level 3 diesel particulate filters. Consistent with CalEEMod 2016.3.2, the diesel particulate filters were assumed to reduce exhaust particulate matter and reactive organic gases emissions by 85 and 90 percent, respectively.

Construction of the proposed project or project variants is expected to begin in 2023 and end in 2026, with construction activities predominantly occurring Monday through Friday. The total estimated pollutant emissions were converted to average daily emission rates using the total number of work days over the construction period (approximately 780 work days). A copy of the project-specific construction information for off-road equipment use and supporting calculations is included in **EIR Appendix G-2, Tables G-2.3** through **G-2.5**. There is always some degree of uncertainty related to emissions from the daily use of off-road construction equipment (e.g., the project sponsor team may need to use different amounts and/or types of off-road equipment at different daily intensities). For this project in particular, the private project co-sponsor chosen by the SFMTA will further refine project plans for the submittal of the entitlement application; therefore, it is possible that the information regarding construction equipment may change.

ON-ROAD VEHICLES

Construction of the proposed project or project variants would generate emissions from on-road vehicle trips for worker commute, vendor trucks, haul trucks, and concrete trucks. In general, workers would commute to the project staging areas, surrounding neighborhoods, or nearby parking garages. Vendor, haul, and concrete truck trips would travel to and from the project staging areas.

Emission factors for running and idling exhaust emissions were derived from air resources board's EMission FACtors Model (EMFAC2017), which accounts for the air resources board's on-road diesel fleet rules, Pavley Clean Car Standards, and the Low Carbon Fuel Standard. The emissions factors for the earliest date of construction (2023) were used for each vehicle type based on EMFAC2017's aggregate speed and model year options. All worker vehicles were assumed to be gasoline powered and all trucks were assumed to be diesel powered.

For worker vehicle, vendor truck, concrete truck, and haul truck trips, the vehicle fleet mix were based on the default parameters from CalEEMod 2016.3.2. For soil disposal trips, it was conservatively assumed that all soils would be transported to the Altamont Landfill in Livermore, which is near the border of the San Francisco Bay Area Air Basin. For trips with unknown destinations, such as worker vehicle, concrete truck, and miscellaneous vendor truck trips, the travel distance for each trip were based on default parameters from CalEEMod 2016.3.2 to calculate total vehicle miles traveled (VMT). Summaries of project-specific construction information and supporting calculations for on-road vehicle trips are included in **EIR Appendix G-2, Tables G-2.6** through **G-2.8**.

OFF-GASSING FROM ARCHITECTURAL COATINGS AND ASPHALT PAVING

ROG off-gassing from architectural coatings was calculated based on the square footage of the proposed building, an assumed VOC content of the paint, and an application rate. The VOC content of the paint is assumed to be consistent with the limits set in BAAQMD Regulation 8, Rule 3. Similarly, ROG off-gassing from paving was calculated based on the paved area of the proposed project and the VOC emission factor per acre of parking area. A copy of the assumptions and calculations for ROG off-gassing are included in **EIR Appendix G-2, Table G-2.9**.

Proposed Project – Construction Emissions

As shown in **Table 3.E.7: Emissions from the Proposed Project During Construction**, unmitigated NOx construction emissions from the proposed project or project variants (92 pounds per day) would exceed the threshold of significance for NOx, representing a significant impact. The unmitigated emissions of ROG, exhaust PM_{10}, and exhaust $PM_{2.5}$ from project construction would be below the thresholds of significance, representing a less-than-significant impact. The largest source of NOx emissions would be from off-road equipment, and the second largest source would be from on-road trucks.

Emission controls on construction equipment would be required to reduce the severity of the average daily NOx emissions, as specified in **Mitigation Measure M-AQ-1: Off-Road Construction Equipment Emissions Minimization**. This mitigation measure would require all off-road diesel-powered construction equipment to use engines that meet Tier 4 Final emission standards. It should be noted that the use of Tier 4 Final engines meets the Clean Construction Ordinance's mandate to use the best available control technologies. The specific technology, use of Tier 4 equipment, is included as **Mitigation Measure M-AQ-1** to provide more specificity of the exact equipment needed to reduce construction criteria air pollutant impacts to less-than-significant levels.

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Table 3.E.7: Emissions from the Proposed Project During Construction

Emission Scenario	Source	Average Daily Emissions (lb/day)			
		NOx	ROG	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Unmitigated Emissions	Off-Road Equipment	46.5	0.2	0.24	0.24
	On-Road Worker Vehicles	0.7	0.2	0.03	0.03
	On-Road Trucks	45.1	0.7	0.24	0.23
	Asphalt Paving/Architectural Coatings	NA	19.9	NA	NA
	Total Emissions	**92**	21	0.5	0.5
	Thresholds of Significance	54	54	82	54
	Above Threshold?	Yes	No	No	No
Mitigated Emissions (M-AQ-1)	Off-Road Equipment [NOTE A]	4.5	0.7	0.08	0.08
	On-Road Worker Vehicles	0.7	0.2	0.03	0.03
	On-Road Trucks	45.1	0.7	0.24	0.23
	Asphalt Paving/Architectural Coatings	NA	19.9	NA	NA
	Total Emissions	50	22	0.4	0.3
	Thresholds of Significance	54	54	82	54
	Above Threshold?	No	No	No	No

Notes: lb = pounds; NOx = nitrogen oxides; ROG = reactive organic gases; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; NA = not applicable

Bold and gray shaded values indicate exceedance of a significance threshold.

[A] The mitigated ROG emissions for the off-road equipment with all Tier 4 engines were slightly higher than the uncontrolled emissions for Tier 2 engines with Level 3 diesel particulate filters. This is because a 90 percent reduction in ROG emissions was uniformly applied to the use of Level 3 diesel particulate filters for Tier 2 engines; however, this reduction was not applied to the Tier 4 engine emissions which are more accurately based on tested emission rates for various ranges of engine horsepower. The actual emissions from Tier 2 engines equipped with Level 3 diesel particulate filters would be very similar to the emissions from a Tier 4 engine.

Source: See spreadsheet calculations in **EIR Appendix G-2, Tables G-2.1 through G-2.9**.

Mitigation Measure M-AQ-1: Off-Road Construction Equipment Emissions Minimization

The SFMTA and private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as project sponsor team) shall comply with the following:

(A) Engine Requirements.

(1) All off-road equipment greater than or equal to 25 horsepower shall have engines that meet U.S. EPA or California Air Resources Board Tier 4 Final off-road emission standards.

(2) Where access to alternative sources of power is available, portable diesel engines shall be prohibited. If access to alternative sources of power is infeasible, portable diesel engines shall meet the requirements of Subsection (A)(1).

(3) Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than two minutes, at any location, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment (e.g., traffic conditions, safe operating conditions). The project sponsor team shall post legible and visible signs in English, Spanish, and Chinese, in designated queuing areas and at the construction site to remind operators of the two-minute idling limit.

(4) The project sponsor team shall instruct construction workers and equipment operators on the maintenance and tuning of construction equipment and require that such workers

and operators properly maintain and tune equipment in accordance with manufacturer specifications.

(B) Waivers.

(1) The San Francisco Planning Department Environmental Review Officer (ERO) may waive the equipment requirements of Subsection (A)(1) if: a particular piece of off-road Tier 4 Final equipment is not regionally available, not technically feasible, or would not produce desired emissions reduction due to expected operating modes. In granting the waiver, the project sponsor team must demonstrate with substantial evidence that the project construction does not exceed the BAAQMD threshold for NOx (54 lbs/day) by resulting in a net increase of average daily NOx emissions greater than 4 pounds per day. The project sponsor team must also demonstrate with substantial evidence that the overall combined construction and operational excess cancer risk does not exceed 7 per 1 million persons exposed at nearby sensitive receptors.

(C) Construction Emissions Minimization Plan.

(1) Before starting onsite construction activities, the project sponsor team shall submit a Construction Emissions Minimization Plan (Plan) to the ERO for review and approval. The Plan shall state, in reasonable detail, how the project sponsor team will meet the requirements of Section A.

(2) The Plan shall include estimates of the construction timeline by phase, with a description of each piece of off-road equipment required for every construction phase. The description may include, but is not limited to: equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel use and hours of operation.

(3) The project sponsor team shall ensure that all applicable requirements of the Plan have been incorporated into the contract specifications. The Plan shall include a certification statement that the project sponsor team agrees to comply fully with the Plan.

(4) The project sponsor team shall make the Plan available to the public for review onsite during working hours. The project sponsor team shall post at the construction site a legible and visible sign summarizing the Plan. The sign shall also state that the public may ask to inspect the Plan for the project at any time during working hours and shall explain how to request to inspect the Plan. The project sponsor team shall post at least one copy of the sign in a visible location on each side of the construction site facing a public right-of-way.

(D) Monitoring

(1) After start of construction activities, the project sponsor team shall submit biannual reports to the ERO documenting compliance with the Plan. After completion of construction activities and prior to receiving a final certificate of occupancy, the project sponsor team shall submit to the ERO a final report summarizing construction activities, including the start and end dates and duration of each construction phase, and the specific information required in the Plan.

Table 3.E.7, p. 3.E.47, presents the mitigated construction emissions from the proposed project or project variants, which assumes the use of all U.S. EPA- or air resources board-approved Tier 4 Final engines on all diesel equipment. With implementation of **Mitigation Measure M-AQ-1**, construction emissions of NOx would be reduced by about 46 percent and would no longer exceed the threshold of significance. Therefore, construction of the proposed project or project variants would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment, and the impact on regional air quality would be less than significant with mitigation.

Impact AQ-2: During operation, the proposed project or project variants would generate criteria air pollutant emissions at levels that would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment. (*Less than Significant*)

Operation of the proposed project or project variants could commence as early as 2026. The primary sources of pollutant emissions during project operation would include vehicle trips, energy use, stationary sources, and area sources such as the use of consumer products and architectural coatings. The net increase in operation-related emissions of criteria air pollutants relative to the existing transit facility operations was calculated in accordance with the Air Quality and Health Risk Assessment Methodology (see **EIR Appendix G-1)**.

Methodology – Operational Emissions

Operation of the proposed project or project variants would generate a net increase in emissions from on-road vehicles associated with worker, residential, and retail trips, except for the Employee and Family Support Variant, which would generate a net increase in emissions from on-road vehicles associated with worker, residential, retail trips, and childcare-related trips. However, the Employee and Family Support Variant would generate incrementally lower emissions than the proposed project or other variants because it would have 56 fewer daily vehicle trips (from 3,208 net-new daily vehicle trips under the proposed project or other variants to 3,152 under this variant).[79] The proposed project or project variants would not generate a net increase in emissions from new bus trips, because all existing and new buses would be electric-powered. The net increase in emissions from other on-road vehicles during operation of the proposed project or project variants were estimated using the methodology described below and based on vehicle trip information provided by the traffic engineer, including daily vehicle trips rates and general fleet mix.

[79] Although the Employee and Family Support Variant would result in 52 more weekday p.m. peak hour trips than the proposed project or other variants; on a daily basis, it would generate fewer vehicle trips and as a result a lower overall pollutant load from long-term operation.

The net increase in VMT was calculated using project-specific vehicle trip generation data from the final travel demand analysis (see **EIR Appendix E-4**) and default travel distance assumptions from CalEEMod 2016.3.2. Because CalEEMod 2016.3.2 has not been updated to incorporate the latest vehicle emission factors from EMFAC2017, the VMT results from CalEEMod were used to calculate the net increase in vehicle emissions outside of CalEEMod by applying emission factors for running, idling, brake wear, and tire wear from EMFAC2017. Based on the final travel demand analysis for the proposed project, it was assumed that about 95 percent of the daily trips generated are light-duty automobiles and about 5 percent of the daily trips generated are medium-heavy-duty trucks. The emissions factors for the existing conditions (2020) and earliest date of operation (2026) were used for each vehicle type based on EMFAC2017's aggregate speed and model year options. In accordance with the Citywide health risk assessment, fugitive $PM_{2.5}$ emissions were estimated assuming that 91 percent of $PM_{2.5}$ emissions from exhaust, brake wear, and tire wear is resuspended as fugitive dust. Based on the air resources board's Entrained Road Travel methodology for paved road dust, fugitive PM_{10} emissions were estimated assuming that fugitive $PM_{2.5}$ emissions are approximately 15 percent of the fugitive PM_{10} emissions. The CalEEMod reports and a summary of the EMFAC2017 emission factors and on-road vehicle emissions calculations are included in **EIR Appendix G-3, Operation Criteria Air Pollutant Calculations and Supporting Documentation**.

The net increase in emissions from energy use and area sources was calculated using CalEEMod 2016.3.2. The selected land use (e.g., high-rise apartment) and input parameters (e.g., square footage) for the model are consistent with the final project description and parameters used for the final travel demand analysis prepared for the proposed project. It was assumed that there would be no woodstoves or fireplaces. Copies of the CalEEMod reports are included in **EIR Appendix G-3**.

Under the existing BAAQMD Permit to Operate, the transit facility is allowed to use up to about 350 gallons of solvents for graffiti removal and 200 gallons of solvents for brake pad cleaning per year, which would result in the daily average emission of about 2.9 pounds of ROG per day. The transit facility currently operates significantly below the permissible limits, using about 3 gallons of solvents for graffiti removal and 6 gallons of solvents for brake cleaning per year.[80] According to the Permit to Operate, the facility's current solvent use would result in less than 0.04 pounds of ROG emissions per day. The proposed replacement transit facility would continue to use solvents for bus cleaning activities in accordance with the emission limitations described under the facility's existing BAAQMD Permit to Operate.[81]

[80] SFMTA, E-mail communication between Licinia Iberri, SFMTA; Peter Mye, SWCA; Patrick Sutton, Baseline; and the San Francisco Planning Department, June 16, 2021.
[81] BAAQMD Permit to Operate, Plant #9427, 2500 Mariposa, San Francisco, CA 94110.

The proposed project or project variants would include up to three new diesel backup generators with a maximum power of 1,000 kilowatts. The net increase in emissions from diesel backup generators were calculated using CalEEMod 2016.3.2. The California Air Toxics Control Measure for Stationary Compression Ignition Engines and BAAQMD Regulation 9, Rule 8, restrict non-emergency use of emergency standby diesel-fueled compression ignition engines to a maximum of 50 hours per year; therefore, it was assumed that each emergency generator would operate 50 hours per year for testing and maintenance purposes. The generators would be permitted with the BAAQMD and would comply with applicable Best Available Control Technology and Best Available Control Technology for Toxics requirements. A copy of the CalEEMod report is included in **EIR Appendix G-3**.

Proposed Project – Operational Emissions

As shown in **Table 3.E.8: Emissions from the Proposed Project During Operation**, the net increase in unmitigated operational emissions from the proposed project or project variants would be below the threshold of significance for NOx, ROG, PM_{10}, and $PM_{2.5}$. Therefore, because the proposed project's or project variants' emissions would be below the operational thresholds of significance, operation of the proposed project or project variants would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment and the impact on regional air quality would be less than significant. As discussed above, the calculations above for long-term operational emissions are conservative (worst-case) because they do not account for emissions reductions that may occur through implementation of the proposed project's or project variants' TDM program or improvements to vehicle emissions overtime due to cleaner engine and fuel technologies.

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Table 3.E.8: Emissions from the Proposed Project During Operation

	Average Daily Emissions (lb/day)			
Emissions Source	**NOx**	**ROG**	**PM_{10}**	**$PM_{2.5}$**
Existing Emissions				
Area	0.0	5.4	0.0	0.0
Energy	1.5	0.2	0.1	0.1
Mobile	5.8	0.5	5.9	1.0
BAAQMD Permit to Operate (Solvent Use)	0.0	0.04	0.0	0.0
Total Existing Emissions	***7.3***	***6.14***	***6.0***	***1.1***
Project Emissions				
Area	0.3	28.4	0.1	0.1
Energy	6.9	0.8	0.5	0.5
Mobile	7.7	0.4	11.3	2.5
BAAQMD Permit to Operate (Solvent Emission Limit)	0.0	2.9	0.0	0.0
Emergency Diesel Generators	4.0	0.9	0.1	0.1
Total Project Emissions	***18.9***	***33.4***	***12.1***	***3.3***
Net Project Emissions (lb/day)	12	24	6.1	2.2
Thresholds of Significance (lb/day)	54	54	82	54
Above Threshold?	No	No	No	No
Net Project Emissions (tons/year)	2.1	4.5	1.1	0.4
Thresholds of Significance (tons/Year)	10	10	15	10
Above Threshold?	No	No	No	No

Notes: lb = pounds; NOx = nitrogen oxides; ROG = reactive organic gases; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter

Source: See CalEEMod reports and spreadsheet calculations in **EIR Appendix G-3**.

Impact AQ-3: Construction and operation of the proposed project or project variants would generate toxic air contaminants, including DPM, at levels which would expose sensitive receptors to substantial pollutant concentrations. ***(Significant and Unavoidable with Mitigation)***

Construction of the proposed project or project variants would generate the following local air pollutants of concern: running exhaust DPM and $PM_{2.5}$ from off-road equipment and on-road trucks, and fugitive $PM_{2.5}$ dust from on-road truck tire wear, brake wear, and resuspension of entrained roadway dust. Operation of the proposed project or project variants would also generate the following local air pollutants of concern: running exhaust DPM, $PM_{2.5}$, and/or TOG from on-road vehicles and emergency diesel generators, and fugitive $PM_{2.5}$ dust from on-road vehicle tire wear, brake wear, and resuspension of entrained roadway dust. The emissions of DPM, $PM_{2.5}$, and TOG during project construction and operation could pose a health risk to nearby sensitive receptors. A health risk assessment was conducted for the proposed project to evaluate the potential health risks to nearby sensitive receptors resulting from project implementation. Health risk assessment findings for the proposed project would also be applicable to the project variants including the Employee and Family Support Variant. As noted above on p. 3.E.40, the proposed residents and on-site childcare use would only be exposed to operational emissions from on-road

vehicles and emergency generator sources (i.e., Scenario 2). The childcare use would be located along Bryant Street near 17th Street.

Methodology

The Citywide health risk assessment evaluated background excess cancer risks and $PM_{2.5}$ concentrations from existing known sources of air pollution, including permitted stationary sources (2014 data), on-road mobile sources (2020 traffic projections), Caltrain passenger diesel locomotives (2014 data), ships and harbor crafts (2017 data), and ferry boats (2017 data). Because offsite receptors within 1,000 feet of the project site are located within an area that currently meets the APEZ criteria for a Health Vulnerability ZIP code (90 per million excess cancer risk or a $PM_{2.5}$ concentration of 9.0 $\mu g/m^3$), a significant health risk impact exists even without the proposed project or project variants. That is, the background health risks already exceed the cumulative thresholds of significance.

A health risk assessment was conducted for the proposed project to determine if construction and/or operation would substantially contribute to existing health risks at offsite sensitive receptors. For informational purposes, the total health risks were also estimated by summing the background health risks from the Citywide health risk assessment with the health risks from the proposed project. Consistent with the Citywide health risk assessment, the health risk assessment prepared for the proposed project focuses on DPM, $PM_{2.5}$, and TOG because these, more so than other types of air pollutants, pose significant health impacts at the local level.[82] A detailed discussion of the methods used for this analysis is provided in the Air Quality and Health Risk Assessment Methodology in **EIR Appendix G-1**.

Consistent with the Citywide health risk assessment, near-field air dispersion modeling of DPM, $PM_{2.5}$, and TOG from project construction and operation was conducted using AERMOD. Dispersion of air pollutants from off-road construction equipment, on-road vehicles, and the emergency generators were modeled using the χ/Q ("chi over q") method, such that each source has a unit emission rate (e.g., 1 gram per second for volume sources). The annual average concentration profiles from the air dispersion model were then scaled according to the ratio between the unit emission rate and the actual emission rate from each source. The AERMOD source input summary files are included in **EIR Appendix G-4, Air Dispersion Modeling and Health Risk Assessment Calculations and Supporting Documentation**, as well as summary of the unit-emission conversion factors for each source of air pollution in **EIR Appendix G-4, Table G-4.3**.

Construction emission rates for off-road equipment and on-road vehicle sources were calculated based on the actual hours of activities over the shortest duration of expected construction (3 years).

[82] San Francisco Department of Public Health, 2020, San Francisco Citywide Health Risk Assessment: Technical Support Documentation, September 2020.

For modeling purposes, it is assumed that construction activities would occur Monday through Friday, between 7 a.m. and 8 p.m. Operational emission rates for on-road vehicles and emergency generator sources were modeled as a continuous source (i.e., emissions occur 7 days a week, 24 hours per day, 365 days per year). For on-road construction truck trips, the emission rates of DPM and $PM_{2.5}$ were estimated based on the assumption that each truck traveled around the entire perimeter of the project site. For on-road operational vehicle trips, the emission rates for DPM, $PM_{2.5}$, and TOG were estimated on the roadway segments near the maximally exposed individual resident based on the project's daily net increase in traffic volumes for light-duty vehicles, trucks, and buses. The net increase in electric-powered buses during project operation would not generate TACs from engine exhaust, but would contribute to the resuspension of fugitive $PM_{2.5}$ dust. Summaries of the on-road emission rate calculations during construction and operation are included in **EIR Appendix G-4, Tables G-4.1** and **G-4.2**.

To evaluate health impacts to offsite receptors, the receptors were modeled at locations co-located with the receptors used in the Citywide health risk assessment and within 1,000 feet of the project site. Receptors were modeled at a height of 1.8 meters or about 6 feet (for ground-level receptors) and 6 meters or about 20 feet (for second-story receptors). Nearby sensitive receptors (e.g., residents) are shown in **Figure 3.D.1** (see p. 3.D.9 in **EIR Section 3.D, Noise and Vibration**). The maximally exposed individual resident is the receptor point where air dispersion modeling indicates the proposed project would have the greatest health risk impact. The maximally exposed individual receptor was determined to be a second-story residential apartment near the northeast corner of Mariposa Street and Hampshire Street. The modeled concentration contours at the maximally exposed individual resident based on the unit emission rate for each air pollution source are included in **EIR Appendix G-4**.

HEALTH RISKS FROM PROJECT CONSTRUCTION AND OPERATION

According to the Citywide health risk assessment, the background excess cancer risk and $PM_{2.5}$ concentration at the offsite maximally exposed individual resident are 183.7 in a million and 10.74 $\mu g/m^3$, respectively. As shown in **Table 3.E.9: Existing Plus Project Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at Maximally Exposed Individual Resident from Project Construction and Operation**, the unmitigated excess cancer risk and $PM_{2.5}$ concentration at the offsite maximally exposed individual resident from existing background sources and construction and operation of the proposed project are 213.4 in a million and 10.84 $\mu g/m^3$, respectively. The unmitigated contribution to existing health risks at the offsite maximally exposed individual resident from construction and operation of the proposed project or project variants would result in a net increase in $PM_{2.5}$ of 0.10 $\mu g/m^3$, which is below the threshold of significance of 0.2 $\mu g/m^3$; however, the net increase in cancer risk from DPM and TOG would be 29.7 in a million, which exceeds the significance threshold of 7.0 in a million and represents a significant impact.

Table 3.E.9: Existing Plus Project Lifetime Cancer Risk and $PM_{2.5}$ Concentration at the Maximally Exposed Individual Resident from Project Construction and Operation

Emission Scenario	Source	Health Risks as MEIR	
		Excess Cancer Risk (per million)	$PM_{2.5}$ ($\mu g/m^3$)
Background Health Risks (Citywide Health Risk Assessment)		183.7	10.74
Unmitigated Project Emissions	Off-Road Construction Equipment	17.66	0.051
	On-Road Construction Trucks	0.10	0.001
	On-Road Operational Vehicles	0.18	0.008
	Emergency Generators	11.80	0.039
	Existing Plus Project Health Risks	213.4	10.84
	Project Health Risks Contribution	**29.7**	0.10
	Thresholds of Significance	7.0	0.2
	Above Threshold?	Yes	No
Mitigated Project Emissions (**M-AQ-1** and **M-AQ-3**)	Off-Road Construction Equipment	6.22	0.018
	On-Road Construction Trucks	0.10	0.001
	On-Road Operational Vehicles	0.18	0.008
	Emergency Generators [NOTE A]	0.37	0.001
	Existing Plus Project Health Risks	190.5	10.77
	Project Health Risks Contribution	6.87	0.03
	Thresholds of Significance	7.0	0.2
	Above Threshold?	No	No

Notes: MEIR = maximally exposed individual resident; $PM_{2.5}$ = fine particulate matter; $\mu g/m^3$ = micrograms per cubic meter

Bold and gray shaded values indicate exceedance of the threshold of significance.

[A] The mitigated health risks shown for emergency diesel generators are the minimum health risk reductions required under **Mitigation Measure M-AQ-3** and are based on a combination of the use of Tier 4 engines, reduced annual testing limits (20 hours per year), and venting above the 75-foot roofline. Additional control measures described under **Mitigation Measure M-AQ-3** that could further reduce health risks from emergency diesel generators are presented in **Table 3.E.10**, p. 3.E.56.

Source: See supporting spreadsheet calculations and modeling inputs in **EIR Appendix G-4**, and health risk modeling results electronically submitted to the San Francisco Planning Department as **EIR Appendix G-5, Project Update to the Citywide Health Risk Assessment Database.**

Emission controls for off-road construction equipment would be required to reduce the overall health risks at offsite sensitive receptors during project construction, as specified in **Mitigation Measure M-AQ-1** (see pp. 3.E.47-3.E.48). Emission controls for emergency diesel generators would also be required to reduce the overall health risks at offsite sensitive receptors during project operation, as specified in **Mitigation Measure M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan**, below (see p. 3.E.57).

To reduce the overall cancer risk at the maximally exposed individual resident below the threshold of significance, the emission controls from the combination of **Mitigation Measures M-AQ-1** and **M-AQ-3** would be required to reduce the severity of exposures to DPM at the maximally exposed individual resident by at least 76.5 percent. **Mitigation Measure M-AQ-1** would require all off-road diesel-powered construction equipment to meet Tier 4 Final emission standards.

As shown in **Table 3.E.10: Emissions Control Measures to Reduce Health Risks at Maximally Exposed Individual Resident during Project Construction and Operation**, p. 3.E.56, implementation of **Mitigation Measure M-AQ-1** would reduce the overall cancer risk at the maximally exposed individual resident by about 38.5 percent. The remaining 38.0 percent reduction needed to reduce the cancer risk at the maximally exposed individual resident below the threshold of significance can be achieved through a combination of exhaust and operational control measures for the emergency diesel generators.

Table 3.E.10: Emissions Control Measures to Reduce Health Risks at Maximally Exposed Individual Resident during Project Construction and Operation

	Health Risks at MEIR		
Control Measures	**Excess Cancer Risk (per million)**	**$PM_{2.5}$ ($\mu g/m^3$)**	**Overall Health Risk Reduction** NOTE A
Off-Road Diesel Construction Equipment			
Uncontrolled	17.66	0.051	---
Tier 4 Final engines	6.22	0.018	38.5%
Emergency Diesel Generators			
Uncontrolled	11.80	0.039	---
Tier 4 Final engines	1.76	0.006	33.8%
Reduce annual testing limit (20 hours/year)	4.72	0.016	23.8%
Vent generator exhaust above the 75-foot roofline of the project building	6.17	0.021	18.9%
Vent generator exhaust on the west or north side of the project building NOTE B	2.44	0.008	31.5%
Tier 4 Final engines, Reduce annual testing limit (20 hours/year), and Vent generator exhaust above the 75-foot roofline of the project building	0.37	0.001	38.4%
Tier 4 Final engines, Reduce annual testing limit (20 hours/year), and Vent generator exhaust on the west or north side of the project building NOTE B	0.15	0.0005	39.2%
Battery-powered generators	0.00	0.000	39.7%

Notes: MEIR = maximally exposed individual resident; $PM_{2.5}$ = fine particulate matter; "---" = not applicable; $\mu g/m^3$ = micrograms per cubic meter; "≥" = more than or equal to

Blue shading indicates measure described under **Mitigation Measure M-AQ-1** for off-road construction equipment.
Green shading indicates measures described under **Mitigation Measure M-AQ-3** for emergency diesel generators.

A The combination of **Mitigation Measures M-AQ-1** and **M-AQ-3** would reduce the overall excess cancer risk at the MEIR by at least 76.5 percent to below the threshold of significance, as shown in **Table 3.E.9**, p. 3.E.55.

B The maximum (i.e., worst-case) health risks associated with venting the generator exhaust on the west or north side of the project building are shown.

Mitigation Measure M-AQ-3 would require the use of exhaust and/or operational control measures for all emergency diesel generators to reduce the overall excess cancer risk at the maximally exposed individual resident by more than 38.0 percent. As shown in in **Table 3.E.10**, a combination of the use of Tier 4 Final engines, reduced annual testing limits (20 hours per year),

and venting the generator exhaust above the 75-foot roofline or on the north or west side of the project building would reduce the overall cancer risk at the maximally exposed individual resident by at least 38.0 percent. Alternatively, the use of battery-powered generators would eliminate health risks associated with DPM from the generators entirely.

Mitigation Measure M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan

The SFMTA and private project co-sponsor and/or its contractors on SFMTA's behalf (referred to below as the project sponsor team shall comply with one of the following:

1. Require all emergency diesel generators to meet Tier 4 Final emission standards, reduce annual testing limit to 20 hours per year for each generator, and vent generator exhaust above the 75-foot roofline of the project building; or
2. Require all emergency diesel generators to meet Tier 4 Final emission standards, reduce annual testing limit to 20 hours per year for each generator, and vent generator exhaust on the west or north side of the project building; or
3. Require all emergency generators to be battery-powered; or
4. The project sponsor team shall retain a qualified air quality consultant to develop an Emergency Diesel Generator Health Risk Reduction Plan. The project sponsor team shall submit the plan to the San Francisco Planning Department Environmental Review Officer (ERO) for review and approval prior to issuance of a permit for emergency diesel generators from the San Francisco Department of Building Inspection or the Bay Area Air Quality Management District. The plan must include, for each emergency diesel generator, a description of the anticipated venting location, engine specifications, and annual maintenance testing procedures. The plan must demonstrate with substantial evidence that annual maintenance testing will not result in the project's overall construction and operational cancer risk exceeding 7 per one million persons exposed at nearby offsite sensitive receptors.

Additionally, the operator of the facility at which the generators are located shall be required to maintain records of the testing schedule for each emergency diesel generator for the life of that generator and to provide this information for review to the San Francisco Planning Department within three months of requesting such information.

As shown in **Table 3.E.9**, p. 3.E.55, implementation of **Mitigation Measures M-AQ-1** and **M-AQ-3** would reduce the excess cancer risk and $PM_{2.5}$ concentration at the maximally exposed individual resident by at least 76.9 percent to 6.87 in a million and 0.03 $\mu g/m^3$, respectively, which are both below the applicable thresholds of significance. As discussed in **Impact AQ-2**, pp. 3.E.49-3.E.52, the health risk assessment results are conservative because they do not account for the long-term operational emissions reductions that may occur through implementation of the proposed project's or project variants' TDM program.

As discussed under **Impact AQ-1**, pp. 3.E.41-3.E.49, emission controls for off-road construction equipment identified in **Mitigation Measure M-AQ-1** would reduce average daily construction emissions of NOx to below the thresholds of significance. These controls would also reduce emissions of ROG, exhaust PM, and exhaust $PM_{2.5}$ which were at levels below the established

thresholds of significance prior to mitigation (see **Table 3.E.7**). As noted in **Table 3.E.10** above, these controls would reduce exposure of sensitive receptors to substantial pollutant concentrations and the overall health risks at offsite sensitive receptors during project construction by 38.5 percent. Although average daily emissions associated with off-road construction equipment use would be reduced because of controls identified in **Mitigation Measure M-AQ-1**, the modeled reductions are premised on a preliminary off-road construction equipment list and assumed intensity of daily use whereas the actual number and type of off-road construction equipment and the intensity of daily use of the off-road construction equipment could potentially be higher. With implementation of **Mitigation Measures M-AQ-1** and **M-AQ-3** the excess cancer health risk exposure would be reduced to just below the threshold of significance of 7.0 in a million (i.e., 6.87 in a million overall with 6.22 in a million attributable to off-road construction equipment after mitigation). The 38.5 percent reduction to the overall cancer risk at the maximally exposed individual resident attributable to **Mitigation Measure M-AQ-1** would not be assured because of potential increases to the off-road construction equipment roster and intensity of average daily use. As a result, the efficacy of the combination of **Mitigation Measures M-AQ-1** and **M-AQ-3** would also not be assured. Although a reasonable worst-case construction scenario for the construction air quality emissions modeling was employed and long-term operational benefits associated with the project's TDM program were not calculated, construction and operation of the proposed project or project variants could result in a substantial increase in the exposure of sensitive receptors to DPM, TOG, and $PM_{2.5}$ and the impact on local air quality is determined to be significant. No additional mitigation measures have been identified and therefore this impact is significant and unavoidable with mitigation.

HEALTH RISKS FROM PROJECT OPERATION ONLY

As shown in **Table 3.E.11: Existing Plus project Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at Maximally Exposed Individual Resident from Project Operation**, the unmitigated excess cancer risk and $PM_{2.5}$ concentration at the maximally exposed individual resident from existing background sources and operation of the proposed project or project variants are 213.5 in a million and 10.83 $\mu g/m^3$, respectively. The unmitigated cancer risk from operation of the proposed project or project variants would result in a net increase in $PM_{2.5}$ at the maximally exposed individual resident of 0.05 $\mu g/m^3$, which is below the threshold of significance of 0.2 $\mu g/m^3$; however, the net increase in cancer risk from DPM and TOG at the maximally exposed individual resident would be 24.75 in a million, which exceeds the significance threshold of 7.0 in a million and represents a significant impact.

The operational cancer risks summarized in **Table 3.E.11** are higher than the operational cancer risks shown in **Table 3.E.9**, p. 3.E.55, because the resident is assumed to be exposed to operational emissions for three additional years (when excluding the three years of construction) and the individual exposure is assumed to begin as an infant when the age sensitivity factor is higher.

Emission controls for the emergency diesel generators would be required to reduce the severity of exposures to DPM at offsite sensitive receptors during project operation, as specified in **Mitigation Measure M-AQ-3**. **Mitigation Measure M-AQ-3** would require the use of exhaust and/or operational control measures for all emergency diesel generators, such as the use of Tier 4 Final engines, reduced annual testing limits (20 hours per year), and venting the generator exhaust above the 75-foot roofline or on the west or north side of the project building. Alternatively, the use of battery-powered generators would eliminate health risks associated with DPM from the generators entirely.

Table 3.E.11: Existing Plus Project Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions at Maximally Exposed Individual Resident from Project Operation

Emission Scenario	Source	Health Risks as MEIR	
		Excess Cancer Risk (per million)	**$PM_{2.5}$ ($\mu g/m^3$)**
Background Health Risks (Citywide Health Risk Assessment)		183.7	10.74
Unmitigated Project Emissions	On-Road Operational Vehicles	0.56	0.008
	Emergency Generators	24.75	0.042
	Existing Plus Project Health Risks	209.0	10.79
	Project Health Risks Contribution	**25.3**	0.05
	Thresholds of Significance	7.0	0.2
	Above Threshold?	Yes	No
Mitigated Project Emissions (M-AQ-3)	On-Road Operational Vehicles	0.56	0.008
	Emergency Generators [NOTE A]	0.21	0.001
	Existing Plus Project Health Risks	184.4	10.75
	Project Health Risks Contribution	0.8	0.01
	Thresholds of Significance	7.0	0.2
	Above Threshold?	No	No

Notes: MEIR = maximally exposed individual resident; $PM_{2.5}$ = fine particulate matter; $\mu g/m^3$ = micrograms per cubic meter

Bold and gray shaded values indicate exceedance of the threshold of significance.

A The mitigated health risks shown for emergency diesel generators are the minimum health risk reductions required under **Mitigation Measure M-AQ-3** and are based on a combination of the use of Tier 4 engines, reduced annual testing limits (20 hours per year), and venting generator exhaust above the 75-foot roofline of the project building. Additional control measures described under **Mitigation Measure M-AQ-3** that could further reduce health risks from emergency diesel generators are presented in **Table 3.E.10**, p. 3.E.56.

Source: See supporting spreadsheet calculations and modeling inputs in **EIR Appendix G-4**, and health risk modeling results submitted electronically submitted to the San Francisco Planning Department as **EIR Appendix G-5**.

As shown in **Table 3.E.11**, implementation of **Mitigation Measure M-AQ-3** would reduce the excess cancer risk and $PM_{2.5}$ concentration at the maximally exposed individual resident by at least 97 percent to 0.8 in a million and 0.01 $\mu g/m^3$, respectively, which are both below the applicable thresholds of significance. Therefore, operation of the proposed project or project variants would not result in a substantial increase in the exposure of sensitive receptors to DPM, TOG, and $PM_{2.5}$ and the impact on local air quality would be less than significant with mitigation.

Impact AQ-4: The proposed project or project variants would not conflict with implementation of the 2017 Bay Area Clean Air Plan. ***(Less than Significant)***

The most recently adopted air quality plan for the San Francisco Bay Area Air Basin is the 2017 Bay Area Clean Air Plan.[83] The 2017 Bay Area Clean Air Plan is a road map that demonstrates how the Bay Area will, in accordance with the requirements of the California Clean Air Act, implement all feasible measures to reduce ozone precursors (ROG and NO_X) and reduce transport of ozone and its precursors to neighboring air basins. It also provides a climate and air pollution control strategy to reduce ozone, PM, TACs, and GHGs that builds upon existing regional, state, and national programs. In determining consistency with the 2017 Bay Area Clean Air Plan, this analysis considers whether the proposed project or project variants would (1) support the primary goals of the plan, (2) include applicable control measures from the plan, and (3) avoid disrupting or hindering implementation of control measures identified in the plan.

The goals of the 2017 Bay Area Clean Air Plan are to protect air quality and health at the regional and local scale and protect the climate. Air quality protection and the safeguarding of public health from harmful air pollutants is accomplished through meeting state and national ambient air quality standards. Climate protection is focused on reducing GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.[84] To meet these goals, the 2017 Bay Area Clean Air Plan recommends specific control measures and actions to reduce emissions and decrease concentrations of harmful air pollutants. To this end, the 2017 Bay Area Clean Air Plan includes 85 control measures aimed at reducing air pollutants in the air basin.[85] These control measures are grouped into various categories: stationary source sector, transportation sector, buildings sector, energy sector, agriculture sector, natural and working lands sector, waste sector, water sector, and super-GHG pollutants sector control measures. Many of these measures address stationary sources and will be implemented by BAAQMD using its permit authority and therefore are not intended for implementation through local planning efforts or project approval actions.

The 2017 Bay Area Clean Air Plan recognizes that, to a great extent, community design[86] dictates individual travel modes and that a key long-term control strategy to reduce emissions of criteria pollutants, TACs, and GHGs from motor vehicles is to channel future Bay Area growth into mixed-

[83] BAAQMD, 2017 Bay Area Clean Air Plan, April 19, 2017, *http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en,* accessed May 5, 2021.

[84] The air district's 2030 GHG target is consistent with the California's GHG 2030 reduction target, per Senate Bill 32. The Air District's 2050 target is consistent with the state's 2050 GHG reduction target per Executive Order S-3-05.

[85] BAAQMD, 2017 Bay Area Clean Air Plan, Table 5-13.

[86] For people who live (and/or work) in low-density, car-oriented developments, the motor vehicle is often the only viable transportation option. In such situations, even the most robust strategy to promote alternative modes of travel can have, at best, only a very modest effect. In contrast, compact communities with a mixture of land uses make it much easier to walk, cycle, or take transit for at least some daily trips.

use pedestrian-friendly communities served by a range of viable transportation options where goods and services meet the day-to-day needs of residents and workers.

The control measures identified in the 2017 Bay Area Clean Air Plan that are most applicable to the proposed project or project variants are transportation sector, building sector, energy sector, natural and working lands sector, waste sector, and water sector control measures, some of which would be implemented as part of, but not limited to, the proposed project's or project variant's compliance with San Francisco's general plan, planning code, green building code, and requirements articulated in the greenhouse gas reduction strategy. The proposed project or project variants would incorporate multiple TDM measures into its operations to promote the use of transit, walking, and bicycling as viable options to privately owned vehicles. TDM measures of the proposed project or project variants have not been defined; however, as one of the components of the project is affordable housing (which exhibit fewer auto trips than market-rate housing) and onsite parking would not be provided, the TDM measures could include car-share parking, bicycle parking spaces, and commuter shower and locker facilities for employees. Additional TDM measures could include delivery supportive amenities (such as temporary storage for package delivery, which may reduce auto trips), bicycle sharing stations, and other approaches to discourage the use of single-occupant private vehicles. Many of the TDM measures and other features of the proposed project or project variants would align with the transportation control measures identified in Table 5-13 of the 2017 Bay Area Clean Air Plan (e.g., TR2-Trip Reduction Programs, TR3-Local and Regional Bus Service, TR9-Bicycle and Pedestrian Access and Facilities, TR13-Parking Policies, TR14-Cars and Light Trucks, and TR15-Public Outreach and Education).

Other features of the proposed project or project variants that would align with the buildings sector, energy sector, natural and working lands sector, waste sector, and water sector control measures of the 2017 Bay Area Clean Air Plan are as follows:

- Development of a building that incorporates battery-electric infrastructure into the replacement transit facility and residential and commercial components along with green roofs and/or solar photovoltaic systems (Buildings Sector-BL1 Green Buildings, BL2 Decarbonize Buildings, and BL4 Urban Heat Island Mitigation)
- Retaining or replacement of existing trees and planting of new trees, resulting in a net increase of new trees planted in the immediate project vicinity (NW2-Urban Tree Planting)
- Adherence to local policies that promote composting and that aim at achieving zero waste for both construction and operations (WA3-Green Waste Diversion and WA4-Recycling and Waste Reduction)
- Installation of high-efficiency fixtures and appliances to reduce potable water demand and a non-potable water reuse system (WR2-Support Water Conservation)

In addition, the impacts of the proposed project or project variants with respect to GHGs is discussed in the initial study (see **EIR Appendix B**, **Section E.9, Greenhouse Gas Emissions**). As stated there, the proposed project or project variants would be compliant with the City's

Greenhouse Gas Reduction Strategy and thus would not result in any significant impacts associated with an increase in GHGs or conflict with measures adopted for the purpose of reducing such emissions. The City's greenhouse gas compliance checklist for public projects list regulatory requirements, many of which are related to transportation, energy conservation, waste reduction, and water conservation and would align with those specific sectors of the 2017 Bay Area Clean Air Plan control measures.

The project site is located within one of the City's transit priority areas, indicating that the proposed project or project variants would be developed at a site in a walkable urban area near a concentration of regional and local transit service. There are multiple Muni bus stops within one block of the project site (see **EIR Section 3.C, Transportation and Circulation**, **Figure 3.C.3: Existing Transit Network in Project Vicinity**, p. 3.C.16). In addition, other viable transportation options would also be available to the residents and employees on the site, including a complete network of 15-foot-wide sidewalks adjacent to the site and protected bicycle lanes on 17th Street. The proposed development (under either the proposed project or the project variants) would be an urban infill development with neighborhood-serving uses in the immediate vicinity that would allow for many of the day-to-day needs to be met by walking, bicycling, or taking transit to or from the project site instead of taking trips via private automobile. These features of the proposed project or project variants would limit substantial growth in automobile trips and vehicle miles traveled. As discussed above under **Impact AQ-2**, the proposed project's or project variant's anticipated increase in net new vehicle trips would result in a less-than-significant increase in air pollutant emissions.

The transportation sector control measures that are identified in the 2017 Bay Area Clean Air Plan would be required (as applicable) under the general plan and the planning code, through the City's Transit First Policy, bicycle parking requirements, and transportation sustainability fees, along with the TDM program. The transportation sector, building sector, energy sector, natural and working lands sector, waste sector, and water sector control measures would also be required under the general plan, planning code, and green building code. Implementation of the applicable control measures identified in the 2017 Bay Area Clean Air Plan along with these policies, requirements, and fees would ensure the proposed project or project variants includes relevant transportation sector, building sector, energy sector, natural and working lands sector, waste sector, and water sector control measures specified in the 2017 Bay Area Clean Air Plan. Therefore, the proposed project and project variants would include applicable control measures identified in the 2017 Bay Area Clean Air Plan and would support the primary goals of the 2017 Bay Area Clean Air Plan.

Examples of a project that could cause the disruption or delay implementation of the 2017 Bay Area Clean Air Plan sector control measures are projects that would preclude the extension of a transit line or bike path, or projects that propose excessive parking beyond City parking requirements. The proposed project or project variants would not preclude the extension of a transit

line or a bike path or any other transit improvement. Except for up to 12 car-share spaces, no parking would be provided for the proposed project's or the project variants' mix of uses (outside of the parking spaces for 213 buses and 97 non-revenue vehicles). For the reasons described above, the proposed project or project variants would not interfere with implementation of the 2017 Bay Area Clean Air Plan. As the proposed project or project variants would be consistent with the applicable air quality plan that demonstrates how the region will improve ambient air quality and achieve the state and federal ambient air quality standards, this impact would be less than significant, and no mitigation measures are necessary.

It should be noted that **Mitigation Measures M-AQ-1** and **M-AQ-3** would implement control measures consistent with measures in the Clean Air Plan that are not specifically applicable to development projects, such as the proposed project or project variants. For example, **Mitigation Measure M-AQ-1**, pp. 3.E.47-3.E.48, which requires use of cleaner, Tier 4 construction equipment, is consistent with the 2017 Bay Area Clean Air Plan Mobile Source Control Measure TR-22, "Construction, Freight and Farming Equipment," which calls for, among other things, incentives to retrofit construction equipment with diesel PM filters or upgrade to electric or Tier 4 engines. **Mitigation Measure M-AQ-3**, p. 3.E.57, which requires the proposed emergency generators to meet more restrictive emissions standards, would be consistent with the 2017 Bay Area Clean Air Plan stationary-source control measure SS-32, "Enforce BAAQMD Regulation 11, Rule 18: Reduction of Risk from Air Toxics Emissions at Existing Facilities," which supports implementing more stringent requirements for stationary sources like the proposed project's or project variant's emergency generators.

Impact AQ-5: The proposed project or project variants would not create objectionable odors that would affect a substantial number of people. ***(Less than Significant)***

The occurrence and severity of odor impacts depends on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. Although offensive odors do not cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and can cause citizens to submit complaints to local governments and regulatory agencies.

Projects with the potential to expose a substantial number of people to objectionable odors are deemed to have a significant impact. Facilities that may generate objectionable odors affecting a substantial number of people include wastewater treatment facilities, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, and food processing facilities.

Construction

Construction of the proposed project or project variants would emit minor sources of odors. Exhaust odors from diesel engines, as well as ROG emissions from asphalt paving and the application of

architectural coatings, may be considered offensive by some individuals. Odors from these sources would be localized and generally confined to the immediately surrounding area. Additionally, odors from diesel fumes, asphalt paving, and architectural coatings would be temporary and would disperse rapidly with distance from the source.

Therefore, construction-generated odors such as diesel fumes would not result in frequent exposure of sensitive receptors to objectionable odor emissions. Construction-related odor impacts from the proposed project or project variants would be less than significant, and no mitigation is necessary.

Operation

Operational land uses associated with the proposed project or project variants would be an expansion of an existing use (the bus storage and maintenance facility). It would also introduce new residential and typical urban retail and commercial uses. A records search indicates that the existing transit facility does not have a history of air quality or odorous substance complaints, and the new uses are not typically generators of substantial odor emissions. The proposed project or project variants would not involve siting a new public facility that would generate substantial odors and would not involve construction of new facilities to house new residents or attract new employees to a location with existing odor sources. Although there may be some potential for small-scale, localized odor issues to emerge around project sources such as solid waste collection, wastewater or stormwater collection/conveyance, etc., substantial odor sources and consequent effects on sensitive receptors would be unlikely as those sources would be located in the basement level. Therefore, the proposed project or project variants would have a less-than-significant impact with respect to generating objectionable odors affecting substantial numbers of people, and no mitigation is necessary.

CUMULATIVE IMPACTS

As described in the "Approach to Analysis" section, p. 3.E.31, the project-specific thresholds of significance for criteria air pollutants are based on levels by which new sources would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment. The proposed project's and project variant's criteria air pollutant emissions are addressed in **Impacts AQ-1** and **AQ-2**. Therefore, no separate cumulative criteria air pollutant analysis is required. The remainder of this cumulative impact section discusses the cumulative localized impacts to air quality that could result from the proposed project or project variants in conjunction with cumulative projects within 1,000 feet from the project's maximally exposed individual resident, as recommended by the air district.[87] The cumulative health risk analysis included the review of cumulative projects within an approximately quarter-mile radius (or approximately 1,320 feet) of the project site to determine which projects are located within

[87] BAAQMD, CEQA Air Quality Guidelines, May 2017, p. 5-2.

1,000 feet of the offsite maximally exposed individual resident and could potentially contribute to health risks at the offsite maximally exposed individual resident. The contributions of TACs from sources beyond 1,000 feet of the offsite maximally exposed individual resident would be greatly attenuated by both distance and intervening structures, and their contribution would be expected to be minimal.

Impact C-AQ-1: The proposed project or project variants, in combination with cumulative development in the project area, would contribute considerably to cumulative health risk impacts on sensitive receptors. ***(Significant and Unavoidable with Mitigation)***

The offsite maximally exposed individual resident is located in an area that currently meets the APEZ criteria for a Health Vulnerability zip code (90 per million excess cancer risk or a $PM_{2.5}$ concentration of 9.0 $\mu g/m^3$) and, therefore, a significant health risk impact already exists. According to the Citywide health risk assessment, the background excess cancer risk and $PM_{2.5}$ concentration at the offsite maximally exposed individual resident are 183.7 in a million and 10.74 $\mu g/m^3$, respectively. As discussed under **Impact AQ-3**, a health risk assessment was conducted to determine whether the proposed project or project variants would substantially contribute to the existing health risks at the offsite maximally exposed individual resident. Health risks from cumulative projects not already included in the Citywide health risk assessment are discussed qualitatively, below, to determine if they could also substantially contribute to the existing health risks at the offsite maximally exposed individual resident.

Cumulative Projects

Eleven development projects and two transportation projects have been identified within a .25-mile radius of the proposed project or project variants that were not included in the Citywide health risk assessment. Descriptions of these cumulative projects are provided in **EIR Section 3.A, Introduction to EIR Chapter 3**, pp. 3.A.6-3.A.8, and shown on **Figure 3.A.1: Cumulative Projects** (p. 3.A.9). They are summarized below in **Table 3.E.12: Cumulative Projects Contributing to Health Risks at the Maximally Exposed Individual Resident**.

Air dispersion of emissions from a pollutant source results in a substantial decrease in the pollutant concentrations with distance. For example, studies show there is about a 70 percent reduction in DPM concentrations from vehicle exhaust within the first 500 feet downwind of a roadway.[88] As shown in **Table 3.E.12**, all projects involving the construction of a new building would be located at least 700 feet from the project's maximally exposed individual resident. At distances of more than 500 feet from the project's maximally exposed individual resident, any health risk impacts from these new construction projects are expected to be negligible.

[88] California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective, April 2005, *http://www.arb.ca.gov/ch/handbook.pdf,* accessed May 5, 2021.

Table 3.E.12: Cumulative Projects Contributing to Health Risks at the Maximally Exposed Individual Resident

Locations	Distance to MEIR (feet)	Project Description
Development Projects		
1850 Bryant Street	700	The project proposes a five-story mixed-use building.
321 Florida Street	980	The project proposes a 10-story mixed-use building and may include an emergency diesel generator.
2435-2445 16th Street	1,050	The project proposes a seven-story residential building and may include an emergency diesel generator.
681 Florida Street	1,080	The project proposes a nine-story mixed-use building and may require an emergency diesel generator.
2750 19th Street	990	The project proposes a six-story mixed-use building.
2747 19th Street	1,150	The project proposes a five-story mixed-use building.
333-335 Potrero Avenue	680	The project proposes to renovate and build a three-story addition onto an existing building for a mixed-use development.
312 Utah Street	805	The project proposes a four-story residential building.
300 Kansas Street	1,400	The project proposes a six-story production, distribution, and repair building.
480 Potrero Avenue	Adjacent	The project proposes to renovate the ground floor of an existing six-story residential building to add one new residential unit.
2601 Mariposa Street	430	The project proposes to renovate and add a floor to the existing building.
Transportation Projects		
16th Street Improvement Project	825	The project proposes to implement improvements along 16th Street from Church to 3rd streets that will include transit-only lanes, transit bulbs, new traffic and pedestrian signals, as well as new streetscape amenities.
SFMTA Northeast Mission Parking Management Plan	0	No construction activities or operational sources of TACs are associated with the parking management plan.

Note: MEIR = maximally exposed individual resident

Source: San Francisco Planning Department, December 2020.

There are two projects located between approximately 430 and 680 feet from the project's maximally exposed individual resident that could require diesel construction equipment, but the scopes of these projects include renovations or additions to existing buildings and, therefore, are not expected to require substantial diesel construction activity. Therefore, because the above cumulative projects that could emit substantial diesel emissions from construction or operations are located far from the project site, it is not anticipated that health risks from any of the identified cumulative projects would combine with health risks from the proposed project or project variants to substantially increase the existing plus project health risks at the project's maximally exposed individual resident.

Project and Cumulative Project Contributions to Background Health Risks

As discussed above, cumulative projects within 1,000 feet of the offsite maximally exposed individual resident are not expected to substantially increase the existing background health risks at the maximally exposed individual resident. However, as discussed under **Impact AQ-3**, the proposed project or project variants would result in a substantial increase in the existing background health risks at the maximally exposed individual resident. As discussed above, p. 3.E.58, even with **Mitigation Measures M-AQ-1** and **M-AQ-3** required as conditions of approval for the proposed project or project variants, construction and/or operation of the proposed project or project variants would result in a substantial increase in the exposure of sensitive receptors to DPM, TOG, and $PM_{2.5}$ and the proposed project's or project variants' contribution to cumulatively significant health risk impacts would be significant and unavoidable with mitigation.

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F. WIND

INTRODUCTION

EIR Section 3.F, Wind, describes the proposed project's impacts on ground-level wind currents at various publicly accessible locations on and near the project site. The Environmental Setting and Regulatory Framework subsections include descriptions of the general wind characteristics in San Francisco, the effects of the natural and built environment on winds, the effects of pedestrian-level winds on people, the regulations used by the City to determine whether the wind impacts of a proposed project would result in ground-level wind currents that exceed defined pedestrian comfort and hazard criteria, and the details of the existing wind environment near the project site. The Impacts and Mitigation Measures subsection identifies the significance criterion for determining if wind impacts are significant under CEQA, describes the analytical approach and model specifications for wind tunnel tests, and presents the evaluation of potential wind impacts for three test scenarios under the proposed project: an existing scenario, which establishes the baseline wind conditions at and around the project site; a project scenario, which evaluates the proposed project's effects on ground-level wind currents; and a cumulative scenario, which evaluates the effects of the proposed project in combination with cumulative projects. The wind data cited in this section are based on the results of the wind tunnel study prepared for the proposed project by the engineering firm Rowan William Davies Irwin (RWDI).[1] See **EIR Appendix H, Pedestrian Wind Study**.

Issues identified in response to the Notice of Preparation (NOP) of an Environmental Impact Report and Notice of a Public Scoping Meeting (**EIR Appendix A**) related to the proposed project's physical environmental impacts were considered in preparing this analysis. The San Francisco Planning Department (planning department) received NOP comments related to wind that focused on general concerns with wind effects (see **EIR Chapter 1, Introduction**, pp. 1.3-1.5).

ENVIRONMENTAL SETTING

SAN FRANCISCO'S EXISTING WIND CONDITIONS

The difference in atmospheric pressure between two points on the earth causes air masses to move from the area of higher pressure to the area of lower pressure. This movement of air masses results in wind currents. Wind directions are reported as directions from which the winds blow.

In San Francisco, meteorological data collected from the United States Weather Bureau weather station atop the San Francisco Federal Building at 50 United Nations Plaza over a six-year period between 1945 and 1950 show that westerly through northwesterly winds are the most frequent and

[1] Rowan Williams Davies & Irwin, Inc. (RWDI), Pedestrian Wind Study - SFMTA Potrero Yard Modernization Project, San Francisco, CA, September 4, 2020. See **EIR Appendix H**.

strongest winds during all seasons.[2] Of the 16 primary wind directions, four have the greatest frequency of occurrence: northwest (10 to 13 percent of all winds), west-northwest (14 to 26 percent of all winds), west (35 to 45 percent of all winds), and west-southwest (2 percent of all winds). They make up more than 60 percent of the general winds and more than 85 percent of the strongest winds and reflect the persistence of sea breezes.

In San Francisco, average wind speeds are highest during the summer and lowest during the winter. The strongest peak wind speeds occur in the winter when wind direction is most variable and strong southerly winds, which are frequent during the approach of a winter storm, occur. Wind speeds exhibit a shifting, but characteristic, pattern over the course of a day, i.e., the highest wind speeds generally occur during the mid-afternoon hours, while the lowest wind speeds often occur during early mornings. Based on over 40 years of recordkeeping, the highest mean hourly wind speeds (approximately 20 mph) occur mid-afternoon in July, while the lowest mean hourly wind speeds (in the range of 6 to 9 mph) occur throughout the day in November.

WIND EFFECTS FROM NATURAL AND BUILT ENVIRONMENT

The direction and speed of wind currents can be altered by natural features of the land and by buildings and structures. In San Francisco, trees and landscaping tend to be at their fullest in the summer months when wind speeds are higher on average, helping to absorb and control windiness near ground level. This is an advantage that San Francisco has over many of its northern city neighbors where the stronger winds occur in the winter months when trees and landscaping are less beneficial in improving the local wind environment. Typically, groups of buildings clustered together tend to act as obstacles that reduce wind speeds and slow winds near ground level, primarily due to the friction and drag of a structure's surface on winds. Building height, exposure, massing, and orientation are also factors that may affect wind speeds and nearby ground-level wind conditions.

Exposure is a measure of the degree to which a building or structure extends above the surrounding built environment into the wind stream. A building surrounded by taller structures is unlikely to cause adverse wind accelerations at the ground level, while even a small building can cause wind acceleration if it is freestanding and exposed. A building that stands alone or is much taller than the surrounding buildings can intercept and redirect winds that might otherwise flow overhead, bringing them down the vertical face of the building where they can create relatively strong and turbulent ground-level winds if unabated by setbacks, façade articulation, or architectural features on the vertical face.

[2] Arens, E. et al., "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," *Building and Environment*, 1989, Vol. 24, No. 4, pp. 297–303.

The massing and orientation (or profile) of a building affect how much wind a building intercepts and whether wind accelerations occur at ground level. Buildings oriented with a wide axis perpendicular to prevailing winds will generally cause greater ground-level wind acceleration than buildings oriented with a narrow axis perpendicular to prevailing winds. In general, slab-shaped buildings oriented perpendicular to the prevailing wind direction have the greatest potential to cause wind acceleration. Buildings with a geometrically complex shape or setbacks have a lesser effect.

Thus, wind impacts are generally caused by large building masses that are substantially taller than their surroundings, and by buildings oriented so that a large wall catches a prevailing wind, particularly if such a wall includes little or no articulation.

WIND EFFECTS ON PEOPLE

The comfort of pedestrians varies under different conditions of sun exposure, temperature, clothing, and wind speed.[3] Winds up to about 4 miles per hour (mph) have no noticeable effect on pedestrian comfort. With speeds from 4 to 8 mph, wind is felt on the face. Winds from 8 to 13 mph will cause clothing to flap and extend a light flag mounted on a pole. Winds from 13 to 19 mph will raise loose paper, dust, and dry soil. With winds from 19 to 26 mph, the force of the wind will be felt on the body. With winds from 26 to 34 mph, umbrellas are used with difficulty, there is difficulty in walking steadily, and wind noise is unpleasant. Winds over 34 mph can result in loss of balance, and gusts can blow people over.[4]

REGULATORY FRAMEWORK

While there are no specific federal or state regulations which deal with wind effects on publicly accessible areas, San Francisco has established several provisions, policies, and procedures that provide the framework to evaluate potential wind impacts from new development and to determine whether wind conditions are suitable for pedestrian activities.

LOCAL REGULATIONS

San Francisco Planning Code Section 148

San Francisco Planning Code (planning code) section 148, Reduction of Ground-level Wind Currents in Downtown Commercial (C-3) Districts, requires buildings in C-3 zoning districts to be shaped so as not to cause ground-level wind currents to exceed defined pedestrian comfort and hazard criteria. The pedestrian comfort and hazard criteria for certain zoning districts elsewhere in

[3] Lawson, T. V., and A. D. Penwarden, "The Effects of Wind on People in the Vicinity of Buildings," Proceedings of the Fourth International Conference on Wind Effects on Buildings and Structures, London, 1975, Cambridge University Press, Cambridge, U.K., 1976, pp. 605-622.

[4] National Oceanic and Atmospheric Administration, Beaufort Wind Scale, *https://www.weather.gov/mfl/beaufort*, accessed December 15, 2020.

the city (the Downtown Residential Districts, the Folsom and Main Residential/Commercial Special Use District, the Van Ness Special Use District, and certain zoning districts in the South of Market neighborhood) are the same as those established for the C-3 zoning districts by section 148 (see also section 243, section 249.1, and section 263.11).

The pedestrian comfort and hazard criteria are based on pedestrian-level wind speeds that include the effects of turbulence; these are referred to as "equivalent wind speeds" (defined in the planning code as "an hourly mean wind speed adjusted to incorporate the effects of gustiness or turbulence on pedestrians").

COMFORT CRITERIA

Section 148 establishes equivalent wind speeds of 7 mph for seating areas and 11 mph for areas of substantial pedestrian use.[5] For projects subject to section 148, the comfort criteria require that wind speeds not exceed these levels more than 10 percent of the time year-round between 7 a.m. and 6 p.m.

HAZARD CRITERION

Section 148 establishes a wind hazard criterion of an equivalent wind speed of 26 mph.[6] Under section 148, new buildings and additions to buildings may not cause wind speeds that meet or exceed this hazard criterion. For projects subject to section 148, no exception may be granted during the review for entitlements for buildings that result in winds that exceed the hazard criterion.

WIND CONDITIONS IN THE PROJECT VICINITY

The proposed project is in the northeast portion of San Francisco's Mission District. The 4.4-acre site (equivalent to two city blocks) is bounded by 17th, Hampshire, Mariposa, and Bryant streets. It is occupied by the SFMTA's Potrero Yard transit facility which consists of a predominantly single-story maintenance and operations building and an asphalt-paved bus yard on the east and west portions of the site, respectively. The site's grade elevation changes by approximately 27 feet

[5] The wind comfort criteria are defined in terms of equivalent wind speed, which is an average wind speed (mean velocity), adjusted to include the level of gustiness and turbulence. Equivalent wind speed is defined as the mean wind velocity, multiplied by the quantity (1 plus 3 times the turbulence intensity) divided by 1.45. This calculation magnifies the reported wind speed when turbulence intensity is greater than 15 percent.

[6] The wind hazard criterion is derived from the wind condition that would generate a three-second gust of wind at 20 meters per second, a commonly used guideline for wind safety. This wind speed, on an hourly basis, is a 26-mph average for a full hour. Because the original Federal Building wind data were collected at one-minute averages, the 26-mph hourly average is converted to a one-minute average of 36 mph, which is used to determine compliance with the 26 mph one-hour hazard criterion in the planning code. (Arens, E. et al., "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," *Building and Environment*, 1989, Vol. 24, No. 4, pp. 297–303.)

from the low southwest corner (Mariposa/Bryant streets) to the high northeast corner (17th/Hampshire streets).

Existing buildings in the immediate area are predominantly two to nine stories. To the north is Franklin Square, an approximately 4.4-acre open space, and the Potrero Center retail complex and parking lot. The pedestrian comfort criterion of 11 mph is established in planning code section 148 for the C-3 zoning districts and is not applicable to the project site. As discussed below, wind modeling of existing conditions indicates that wind speeds at 46 of the 70 grade-level test point locations around the project site and vicinity currently exceed the pedestrian comfort criterion (see **Figure 3.F.1: Locations of Wind Study Test Points)**. The remaining 24 test point locations comply with the comfort criterion. The average equivalent wind speed for the wind comfort analysis at all locations is approximately 13 mph.

Under existing conditions, three of the 70 test point locations currently exceed the wind hazard criterion of 26 mph for more than one hour per year for a total of 58 hours per year. The highest wind speed occurs along 17th and Hampshire streets, immediately north and east of the project site.

These conditions exist due to the Franklin Square open space and lack of buildings taller than 80 feet in the upwind areas west of Bryant Street and north of 17th Street. This allows the prevailing northwesterly, west-northwesterly, and westerly winds direct access to this area with relatively little disruption from intervening buildings. With a relatively unobstructed path northwesterly to westerly winds are redirected downward and channeled to the south at ground level. Thus, the prevailing winds are sufficiently strong and turbulent at and near ground level at the intersection of 17th and Hampshire streets to create hazards. Existing wind speeds within publicly accessible pedestrian areas surrounding the project site are also sufficient to affect pedestrian comfort, particularly during the summer afternoons when winds tend to be stronger on average.

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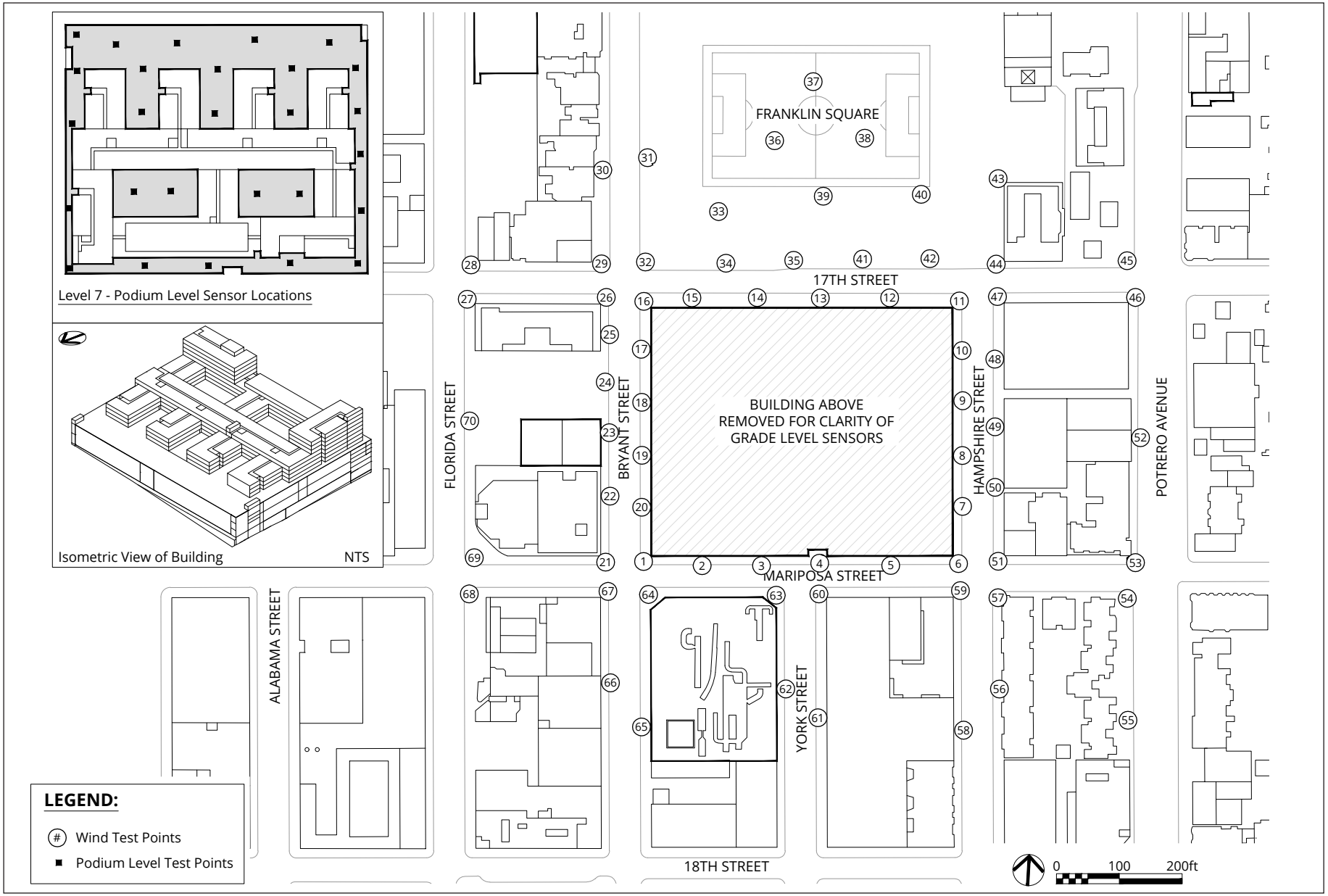

Source: RWDI, September 2020

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FIGURE 3.F.1: LOCATIONS OF WIND STUDY TEST POINTS

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLD

San Francisco Administrative Code chapter 31 directs the planning department to identify environmental effects of a project using as its base the environmental checklist form set forth in Appendix G of the CEQA Guidelines. As it relates to wind, Appendix G asks if the project would:

- create wind hazards in publicly accessible areas of substantial pedestrian use.

To assess whether a project would result in a significant impact under the CEQA, the planning department uses the planning code's hazard criterion as defined by section 148. That is, the City determines whether a project would cause equivalent wind speeds to reach or exceed the 26-mph wind hazard criterion. If a project would cause a new wind hazard or exacerbate an existing wind hazard in a publicly accessible area of substantial pedestrian use, it would be considered a significant wind impact for the purposes of CEQA.

As also described above, section 148 establishes wind comfort criteria for the C-3 zoning districts, whereby a project shall not cause ground-level wind currents to exceed, more than 10 percent of the time, 11 mph in areas of substantial pedestrian use, and 7 mph in public seating areas. In San Francisco, exceedances of the wind comfort criteria are not significant environmental impacts for the purpose of CEQA; thus, this EIR section focuses on the wind hazard analysis. The proposed project's wind effects relative to the pedestrian comfort criteria are presented in **EIR Appendix H** for informational purposes only, along with information on wind speeds at grade-level test locations within the existing 17th Street bicycle lane, and do not factor into the determination of significance.

APPROACH TO ANALYSIS

The project site is not located in a zoning district subject to the provisions of section 148 or any other planning code sections that include provisions related to ground-level wind currents (i.e., the required project approvals do not include exceptions from the wind comfort criteria established in section 148). However, for purposes of CEQA the hazard criterion is used to determine the significance of winds, and an exceedance of this criterion is considered a significant impact pursuant to CEQA.

Project Features

The proposed project consists of the construction of a new 13-story, 150-foot-tall structure, as measured along Mariposa Street (not including elevator and mechanical penthouses). It would replace the existing transit facility with a new transit facility and joint development (residential and commercial components). The proposed project would also include a request to reclassify the

height limit for the project site from 65 to 150 feet. The proposed project has the potential to affect ground-level wind conditions around and near the project site.

The proposed project would have two volumetric components rising to an overall height of up to 150 feet. A three-level (or six-story), 75-foot-tall podium element for the new transit facility, the commercial component, and portions of the residential component would occupy the full site except for a 5-foot-wide planting strip along the northern property line. The transit facility podium would be surmounted by a vertical element for the remainder of the residential component (three- to seven-story residential structures ranging in height from 30 to 70 feet). The tallest portions of the new residential development atop the transit facility podium would be located on the southern portion of the site. The three- to seven-story residential structures atop the transit facility podium would be set back from the north, east, south, and west edges of the 75-foot-tall podium element.

The proposed project also includes construction of new open space on the rooftop of the podium, along its northern portion where the three-story residential structures atop the transit facility podium are set back from the north edge of the 75-foot-tall podium element. This new open space may be available to the public but is now currently contemplated as open space for use by building residents and the SFMTA.

The proposed project also includes four project variants as described in **EIR Chapter 2, Project Description**, pp. 2.56-2.58. The proposed building position, height, and bulk/massing of the project variants would be the same as those of the proposed project. Therefore, wind impacts of the project variants would be identical to those of the proposed project and no separate analysis of the project variants is necessary.

Technical Standards

At a height of 150 feet, the proposed project would be substantially taller than existing nearby buildings and has the potential to intercept winds that might otherwise flow overhead. These winds can be redirected down the vertical face of the building and alter ground-level wind conditions on the sidewalks along Bryant, 17th, Hampshire, and Mariposa Streets and beyond. For these reasons, the proposed project is required to undergo wind tunnel testing. Any proposed development project in San Francisco that requires a wind tunnel analysis must follow the standard methodology established by the planning department. Under the standard methodology, the wind tunnel analysis relies on wind data collected from the United States Weather Bureau weather station atop the Federal Building at 50 United Nations Plaza. Wind data from 7 a.m. to 6 p.m. are used, because this time period represents peak pedestrian activity in an urban setting.

RWDI conducted a wind tunnel test of the proposed project using a 1:300 scale model of the proposed project and surrounding buildings within a 1,500-foot radius[7] of the project site. The scale model, which is equipped with permanently mounted wind speed sensors, was placed inside an atmospheric boundary layer wind tunnel. Using 16 wind directions (in 22.5-degree increments) wind tunnel tests were then conducted for the project site and vicinity using the following three different scenarios:

1. Existing Conditions: This scenario consists of the existing structures on the project site and the existing surrounding buildings.[8,9]
2. Existing Conditions Plus Proposed Project: This project scenario consists of the proposed project and the existing surrounding buildings. As described in **EIR Chapter 2, Project Description**, on p. 2.18 under "Project Background" due to the public and private nature of the joint development the building design is at an early stage. Therefore, the scale model of the proposed project tested in the wind tunnel lacks façade articulation or architectural features beyond the setbacks defined above – at the ground level and on the podium.[10]
3. Proposed Project Plus Cumulative: For this cumulative scenario, which includes the proposed project and the existing surrounding buildings, a 1,500-foot radius was established around the project site.[11]

The number and locations of the wind study test points were selected by the wind consultant and the planning department based on the presence of public areas on and around the project site and how the proposed project could affect pedestrian-level wind patterns throughout the project vicinity (see **Figure 3.F.1**, p. 3.F.6). Pedestrian-level wind speeds were measured at 70 locations for each of the three scenarios at an effective-full-scale height of approximately 6 feet above ground, which is the standard height used for assessing wind effects on pedestrians.

The section 148 wind hazard criterion of 26 mph is defined by a wind speed that is measured and averaged over a period of one hour. When stated on the same time basis as the comfort criteria wind speeds, the hazard criterion wind speed (26 mph averaged over a single one-hour, or approximately 0.0114 percent of the time in a year) is equivalent to a one-minute average of 36 mph. Thus, test results presented in the wind tunnel report for the proposed project and in this section of the EIR use the one-minute average of 36 mph for the hazard criterion.

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[7] The American Society of Civil Engineers has established a minimum standard of an 820-foot radius for wind tunnel testing. RWDI uses a 1,500-foot radius, because that is the largest radius that can be covered by the scale model that would fit into the wind tunnel. In addition, buildings that are more than 1,500 feet from a project site would have little to no effects on winds on and around the project site in a densely developed urban environment such as San Francisco.

[8] Wind tunnel testing typically does not include trees or landscaping or topography as a baseline or project condition thus presenting reasonable worst case test scenarios for purposes of the CEQA analysis.

[9] RWDI, Appendix B1, Image 2A, Wind Tunnel Study Model – Existing Configuration, p. 1 and Figure 2.A, Pedestrian Wind Hazard Conditions – Existing, February 21, 2020.

[10] RWDI, Appendix B1, Image 2B, Wind Tunnel Study Model – Existing + Project Configuration, p. 2 and Figure 2.B, Pedestrian Wind Hazard Conditions – Existing + Project, March 4, 2020.

[11] RWDI, Appendix B1, Image 2C, Wind Tunnel Study Model – Project + Cumulative Configuration, p. 3 and Figure 2.C, Pedestrian Wind Hazard Conditions – Project + Cumulative, March 4, 2020.

IMPACT EVALUATION

Impact WI-1: The proposed project or project variants would create wind hazards in publicly accessible areas of substantial pedestrian use in the vicinity of the project site. ***(Less than Significant with Mitigation)***

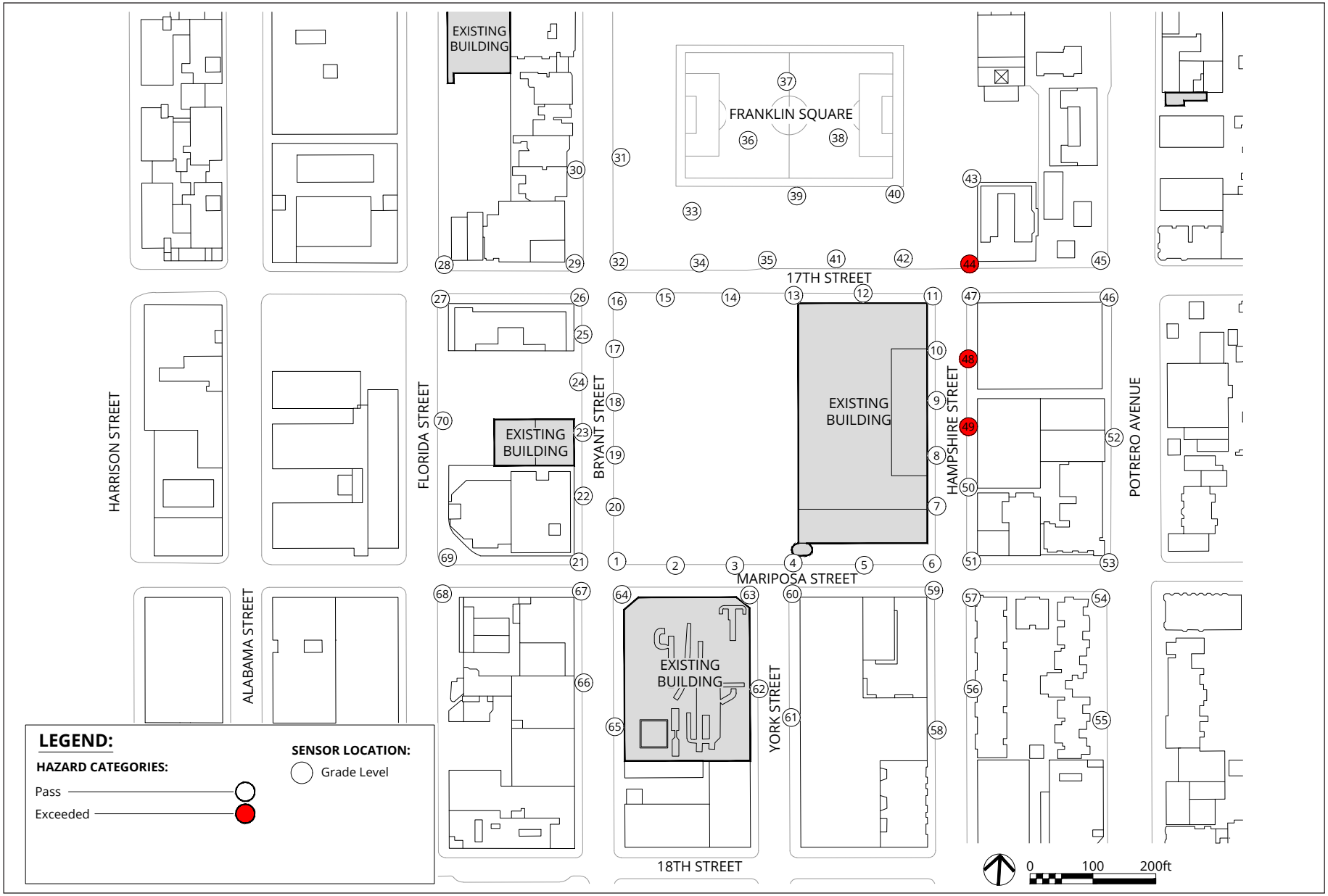
Wind Hazard Analysis

The study area is prone to hazardous wind conditions at specific locations on 17th and Hampshire streets. Under existing conditions, three of the 70 test points exceed the hazard criterion, with the total number of hours exceeding the hazard criterion reaching 58 hours per year. The test points at which the hazard criterion is exceeded are as follows: on the north sidewalk of 17th Street near the intersection with Hampshire Street; on the eastern sidewalk of Hampshire Street south of the intersection with 17th Street; and at the midblock of the eastern sidewalk of Hampshire Street (see test points 44, 48, and 49 on **Figure 3.F.2: Wind Hazard Results – Existing Scenario**). The test results presented in **Table 3.F.1: Wind Hazard Analysis Results – Existing, Project and Cumulative Scenarios (Without Mitigation)**, pp. 3.F.13-3.F.14, use the one-minute average of 36 mph for the wind hazard criterion. Exceedances range from a one-minute average of 37 mph at test point 49 to a one-minute average of 47 mph at test point 44.

A new 150-foot-tall structure with limited setbacks for the 75-foot-tall podium element and no façade articulation, architectural features (canopies and marquees), or landscaping would adversely affect ground-level wind currents. When compared to existing conditions, implementation of the proposed project would change wind patterns such that two new exceedances (test points 1 and 11) would be created and one existing hazard criterion exceedance (test point 49) would be eliminated, resulting in a net change of one new exceedance. (See test points 1, 11, 44, and 48 on **Figure 3.F.3: Wind Hazard Results – Project Scenario**.) Test point 1 is on the northeast corner of the Bryant/Mariposa sidewalk. Test point 11 is on the southwest corner of the 17th/Hampshire intersection.

At the two test points locations where exceedances would be created with the proposed project or project variants, wind speeds would increase over existing conditions as follows:

- Test point 1 – from a one-minute average of 24 mph under existing conditions to 42 mph with the proposed project or project variants, with an increase of approximately 18 hours annually when the wind hazard is exceeded
- Test point 11 – from a one-minute average of 35 mph under existing conditions to 37 mph with the proposed project or project variants, with an increase of approximately 2 hours annually when the wind hazard is exceeded



Source: RWDI, March 2020

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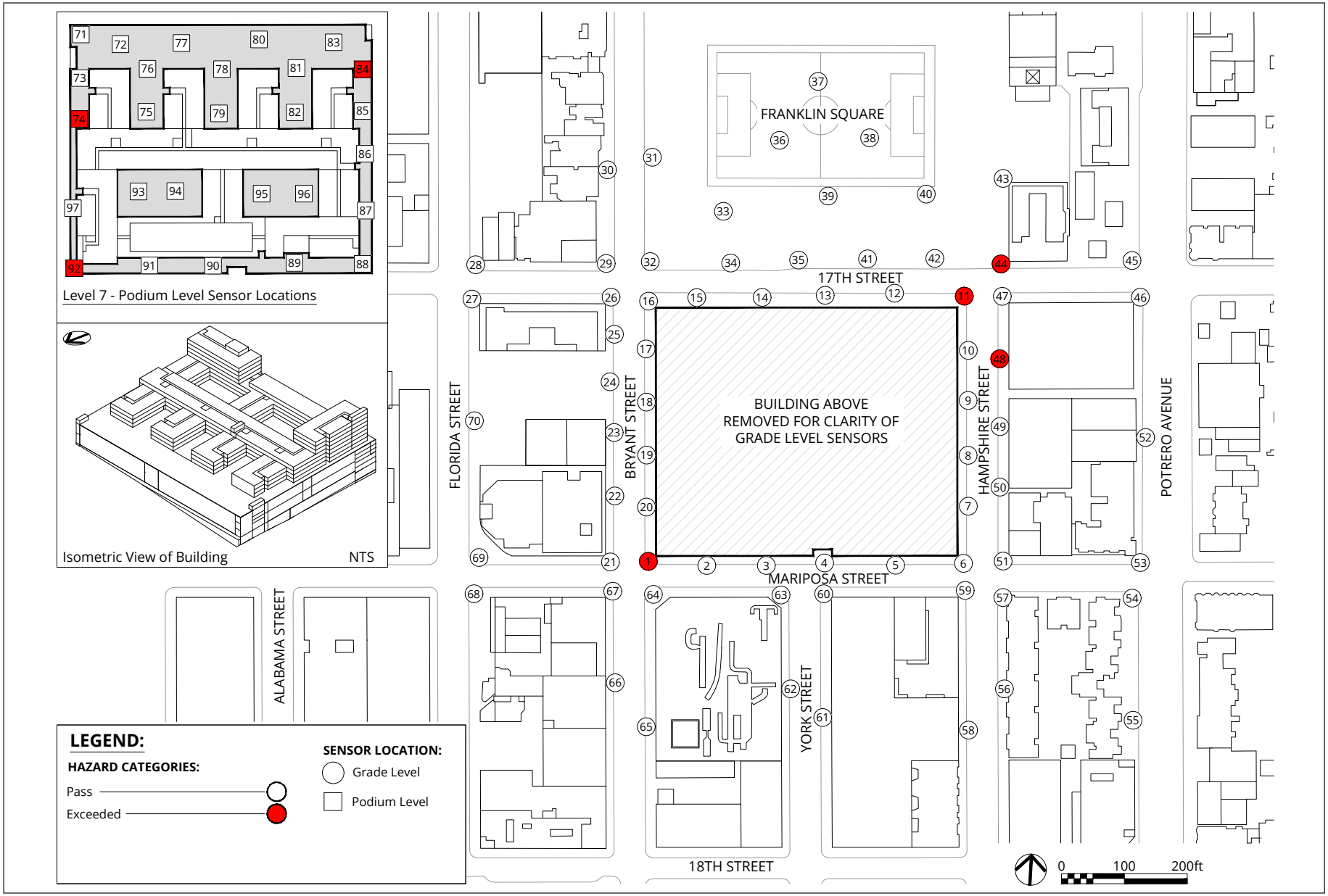
FIGURE 3.F.2: WIND HAZARD RESULTS – EXISTING SCENARIO



Source: RWDI, March 2020

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FIGURE 3.F.3: WIND HAZARD RESULTS – PROJECT SCENARIO

Table 3.F.1: Wind Hazard Analysis Results – Existing, Project and Cumulative Scenarios (Without Mitigation)

Location Number	Hazard Criterion (mph)	Existing Scenario			Project Scenario				Cumulative Scenario				
		Wind Speed Exceeded 1 Hour per Year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1 Hour per Year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 Hour per Year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Hours Change Relative to Project	Exceeds
1	36	24	0		42	18	18	n	36	1	1	17	n
2	36	26	0		29	0	0		33	0	0	0	
3	36	25	0		28	0	0		26	0	0	0	
4	36	25	0		20	0	0		19	0	0	0	
5	36	25	0		18	0	0		18	1	0	0	
6	36	19	0		19	0	0		19	0	0	0	
7	36	20	0		20	0	0		21	0	0	0	
8	36	21	0		21	0	0		22	0	0	0	
9	36	25	0		16	0	0		18	0	0	0	
10	36	29	0		16	0	0		17	0	0	0	
11	36	35	0		37	2	2	n	38	5	5	3	n
12	36	27	0		30	0	0		30	0	0	0	
13	36	28	0		26	0	0		24	0	0	0	
14	36	27	0		25	0	0		21	0	0	0	
15	36	24	0		19	0	0		17	0	0	0	
16	36	22	0		35	0	0		30	0	0	0	
17	36	23	0		28	0	0		26	0	0	0	
18	36	24	0		25	0	0		28	0	0	0	
19	36	22	0		27	0	0		25	0	0	0	
20	36	23	0		31	0	0		26	0	0	0	
21	36	24	0		33	0	0		31	0	0	0	
22	36	14	0		22	0	0		20	0	0	0	
23	36	17	0		21	0	0		21	0	0	0	
24	36	24	0		30	0	0		23	0	0	0	
25	36	10	0		23	0	0		24	0	0	0	
26	36	19	0		23	0	0		24	0	0	0	
27	36	25	0		24	0	0		31	0	0	0	
28	36	19	0		18	0	0		39	5	5	5	n
29	36	21	0		23	0	0		24	0	0	0	
30	36	10	0		20	0	0		18	0	0	0	
31	36	23	0		23	0	0		23	22	0	0	
32	36	20	0		31	0	0		27	0	0	0	
33	36	25	0		25	0	0		22	0	0	0	
34	36	25	0		24	0	0		24	0	0	0	
35	36	26	0		26	0	0		26	0	0	0	
36	36	26	0		25	0	0		26	0	0	0	
37	36	30	0		28	0	0		27	4	0	0	
38	36	30	0		29	0	0		29	0	0	0	
39	36	27	0		26	0	0		26	0	0	0	
40	36	28	0		26	0	0		27	14	0	0	
41	36	26	0		27	0	0		27	0	0	0	
42	36	27	0		27	0	0		28	0	0	0	
43	36	32	0		29	0	0		31	0	0	0	

(Table 3.F.1 continued)

Location Number	Hazard Criterion (mph)	Existing Scenario			Project Scenario				Cumulative Scenario				
		Wind Speed Exceeded 1 Hour per Year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1 Hour per Year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 Hour per Year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Hours Change Relative to Project	Exceeds
44	36	47	55	e	45	36	-19	e	45	34	-21	-3	e
45	36	31	0		28	0	0		25	0	0	0	
46	36	35	0		30	0	0		33	0	0	0	
47	36	33	0		31	0	0		32	0	0	0	
48	36	38	2	e	43	30	28	e	43	30	28	0	e
49	36	37	1	e	35	0	-1	--	37	1	0	1	e
50	36	30	0		22	0	0		23	0	0	0	
51	36	26	0		16	0	0		16	0	0	0	
52	36	21	0		17	0	0		18	0	0	0	
53	36	21	0		18	0	0		19	0	0	0	
54	36	30	0		15	0	0		16	0	0	0	
55	36	20	0		18	0	0		17	0	0	0	
56	36	26	0		21	0	0		22	0	0	0	
57	36	32	0		16	0	0		15	0	0	0	
58	36	21	0		16	0	0		16	0	0	0	
59	36	30	0		18	0	0		19	0	0	0	
60	36	22	0		24	0	0		21	0	0	0	
61	36	31	0		21	0	0		22	0	0	0	
62	36	21	0		14	0	0		14	0	0	0	
63	36	34	0		32	0	0		28	0	0	0	
64	36	29	0		33	0	0		33	0	0	0	
65	36	31	0		28	0	0		29	0	0	0	
66	36	20	0		26	0	0		22	0	0	0	
67	36	22	0		24	0	0			0	0	0	
68	36	22	0		21	0	0		24	0	0	0	
69	36	23	0		23	0	0		20	0	0	0	
70	36	28	0		25	0	0		28	0	0	0	
		Average	**Sum**	**Sum**	**Average**	**Sum**	**Sum**	**Sum**	**Average**	**Sum**	**Sum**	**Sum**	**Sum**
		25	**58**	**3**	**25**	**86**	**28**	**4**	**25**	**76**	**18**	**-10**	**6**
			Existing, e	3			Existing, e	2			Existing, e		3
							New, or increased time, p				New, or increased time, p		
							New, at new location, n	2			New, at new location, n		3
							Eliminated by Proposed Project, --	1			Eliminated by Proposed Project, -		0

Source: RWDI, Appendix B1, Table 2.1: Wind Hazard Conditions – Grade Level, March 4, 2020. See **EIR Appendix H**.

At test point 44 where the exceedance would remain, wind speeds would decrease from a one-minute average of 47 mph under existing conditions to 45 mph with the proposed project or project variants. This would result in a reduction of approximately 19 hours annually when the wind hazard is exceeded.

At test point 48 where the exceedance would also remain, wind speeds would increase from a one-minute average of 38 mph under existing conditions to 43 mph with the proposed project or project variants. This would result in an increase of approximately 28 hours annually when the wind hazard is exceeded.

At test point 49 where the exceedance would be eliminated, wind speeds would fall from a one-minute average of 37 mph under existing conditions to 35 mph with the proposed project or project variants. This would result in a reduction of approximately 1 hour annually when the wind hazard is exceeded.

In addition to a net increase of one hazard exceedance location, the total number of hazard exceedance hours per year under the proposed project or project variants would also increase for a total duration of 86 hours annually. This would represent an increase over existing conditions of approximately 28 hours annually when the wind hazard is exceeded. Under the proposed project or project variants, exceedances would range from a one-minute average of 37 mph at test point 11 to a one-minute average of 45 mph at test point 44. The remaining 66 locations tested in the study area currently comply with the City's wind hazard criterion.

Thus, implementation of the proposed project or project variants would result in a net increase of one wind hazard exceedance resulting in substantial changes to ground-level wind conditions in a publicly accessible area of substantial pedestrian use. As a result, the proposed project or project variants would have a significant wind impact.

As noted on p. 3.F.9, the physical model tested in the wind tunnel did not include topography, street trees, or other landscaping. The physical model also did not include a building volume with façade articulation or architectural details beyond the 5-foot-deep setback along 17th Street for the podium and the setback of the vertical elements on the podium. Thus, mitigation in the form of changes to the building's massing and design would be required to reduce the impact to a less-than-significant level (see **Mitigation Measure M-WI-1: Design Measures to Reduce Project-Specific Wind Impacts**, p. 3.F.17).

RWDI, in consultation with the planning department and the San Francisco Municipal Transportation Agency (SFMTA), refined the model in various ways to address the project-specific wind hazard exceedance at test point 1. The architectural detailing and building mass changes identified as potential design measures that could reduce project-specific wind impacts included the following:

- a recessed building corner[12] at the building's southwest corner
- vertical wind screens at grade level
- vertical elevated screens on the west façade
- porous façades on portions of the west, north, and east elevations
- landscaping on adjacent sidewalks

The physical model was also updated so the existing, project and cumulative scenarios include the influence of local terrain changes at the Franklin Square open space as well as existing landscaping.

The wind reduction measures identified in **Mitigation Measure M-WI-1** were tested to determine if they help reduce ground-level wind conditions (see **EIR Appendix H, Pedestrian Wind Study, September 2020** and Appendix B2 and Appendix B3 of the wind study). The testing of the mitigated project scenarios indicates the following model changes and building design measures would 1) incorporate existing terrain and landscaping into the existing conditions baseline and 2) enable reduction of the significant wind impact to a less-than-significant level:

- Wind hazard exceedances under updated existing conditions would be reduced from three locations to two locations and the exceedance locations would shift from test points 44, 48, and 49 to test points 44 and 47. The total number of hours the wind hazard criterion would be reached or exceeded would decrease by 28 hours, from 58 hours per year under the model that does not reflect local terrain changes, street trees, or other landscaping to 30 hours per year under the updated physical model that does include these features.[13]
- Wind hazard exceedances under the mitigated project scenario would be reduced from four to two with test point 44 remaining an exceedance, test point 47 eliminated, a new exceedance at test point 48, and no exceedances at test points 1 and 11. The total number of hours the wind hazard criterion would be reached or exceeded would decrease by 68 hours, from 86 hours per year under the unmitigated project scenario to 18 hours per year for the mitigated project scenario.[14]
- The introduction of porous façades (at 50 percent porosity) on portions of the west, north, and east elevations; a recessed corner at the building's southwest corner, and proposed landscaping on adjacent sidewalks proved to be the most effective wind control measures.

Implementation of **Mitigation Measure M-WI-1** would reduce the impact to a less-than-significant level. Due to the preliminary nature of the current design and the potential refinements to the proposed building mass after the completion of the developer selection process, further wind tunnel testing and/or refinement of wind reduction measures may be warranted. The revised project

[12] Massing setbacks from the property line to create a notch at a building corner.
[13] RWDI, Image 2A, Wind Tunnel Study Model – Existing Configuration (Revised), p. 4, Figure 2.A, Pedestrian Wind Hazard Conditions – Existing (Revised), July 2, 2020, and Table 2.1, Wind Hazard Conditions (Revised). See **EIR Appendix H, Pedestrian Wind Study, September 2020**.
[14] RWDI, Image 2B, Wind Tunnel Study Model – Existing + Project Configuration (Revised), p. 5, Figure 2.B, Pedestrian Wind Hazard Conditions – Existing + Project (Revised), July 2, 2020, and Table 2.1, Wind Hazard Conditions (Revised).

design would be reviewed by the planning department to determine if a new wind tunnel test or a new qualitative report is required, in accordance with **Mitigation Measure M-WI-1**. Implementation of **Mitigation Measure M-WI-1** would ensure that the proposed project or project variants would incorporate design measures with demonstrated effectiveness in reducing ground level wind speeds and therefore, would not result in substantial changes to ground-level wind conditions in a publicly accessible area of substantial pedestrian use.

Mitigation Measure M-WI-1: Design Measures to Reduce Project-Specific Wind Impacts

The project sponsor team shall retain a qualified wind consultant to prepare, in consultation with the San Francisco Planning Department (planning department), a wind impact mitigation report that identifies design measures to reduce the project's wind impacts in the project scenario. Prior to certification of the Final Environmental Impact Report, the project sponsor team shall submit the wind impact mitigation report to the planning department for its final review and approval. The wind impact mitigation report shall incorporate updated information on the building design based on a list of potential wind reduction measures identified below, along with the estimated effectiveness of each measure to reduce the identified off-site wind hazards.

- Porous façades on portions of the north, east and west sides for natural ventilation as part of the heating, ventilation, and air conditioning strategy for the new transit facility at the second and third levels
- Recessed building corner up to 12 feet in height at the southwest corner of proposed building near Bryant/Mariposa intersection
- Vertical elevated screens on portions of the second and third levels of the west façade (Bryant Street)
- Vertical wind screens at grade level on the adjacent Bryant Street sidewalk near the Bryant/Mariposa intersection

Such wind reduction design measures may include additional on-site landscaping, or equivalent wind-reducing features; and off-site wind reduction measures such as landscaping, streetscape improvements or other wind-reducing features, such as wind screens.

The project sponsor team shall implement as many of the design measures identified in the wind impact mitigation report as needed to reduce the proposed project's or project variant's potential to create a new wind hazard or exacerbate an existing wind hazard in publicly accessible areas of substantial pedestrian use to less-than-significant levels. The final wind impact mitigation report should not find that the project produces a net increase of the already identified wind hazard exceedances. The planning department shall approve the final list of wind reduction measures that the project sponsor team shall implement.

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CUMULATIVE IMPACTS

Impact C-CR-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not alter wind in a manner that would make a cumulatively considerable contribution to a significant cumulative wind impact. ***(Less than Significant with Mitigation)***

Wind Hazard Analysis

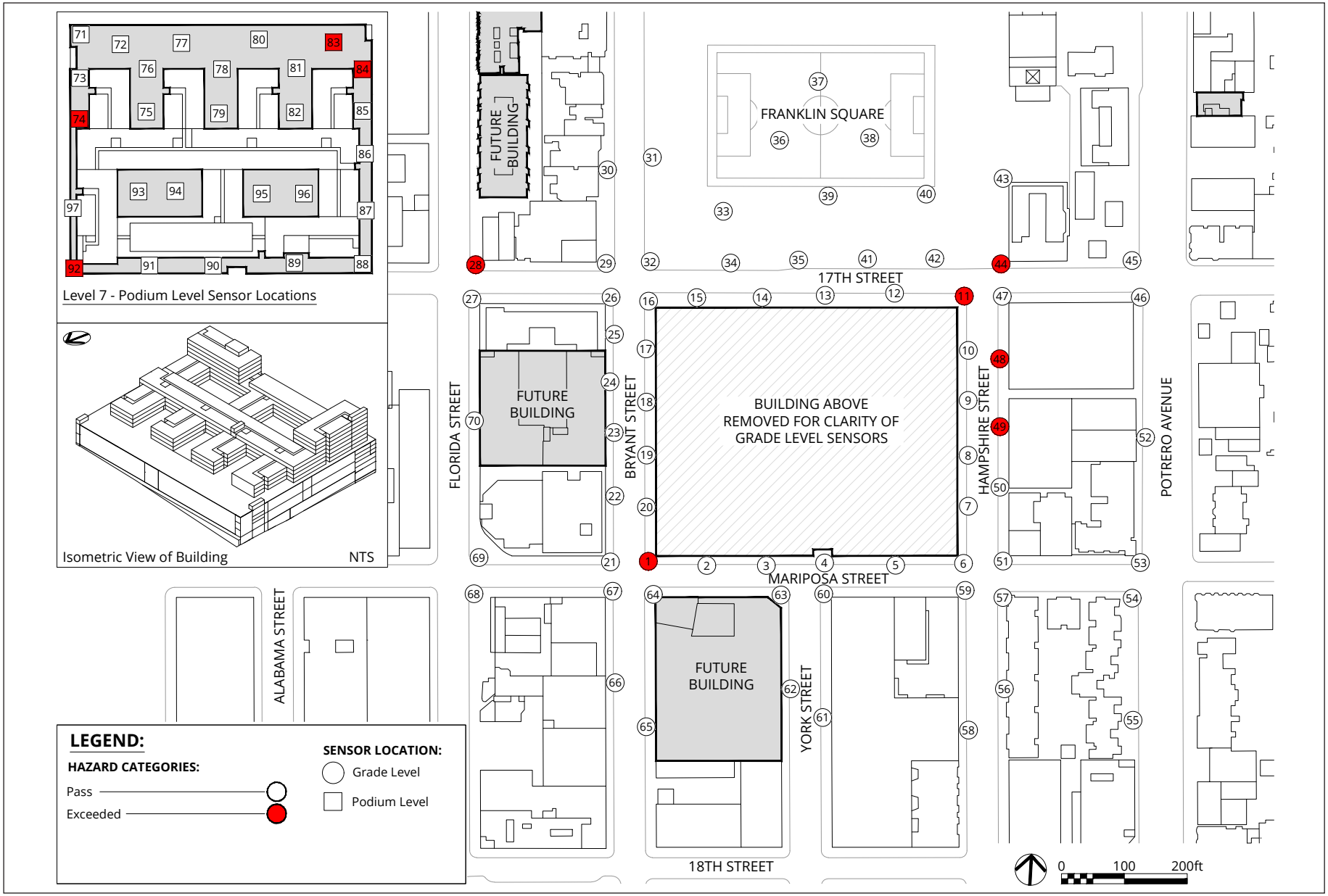
For the cumulative scenario, the following development projects are included in the wind study model (see **Figure 3.A.1** and **Table 3.A.1** on pp. 3.A.7-3.A.9 in **EIR Section 3.A**):

- 2435-2445 16th Street: a seven-story (68/78 feet) residential development
- 1850 Bryant Street: a five-story (68 feet) mixed-use development
- 321 Florida Street: a 10-story (104 feet) mixed-use development
- 333-335 Potrero Avenue: a five-story (64/74 feet) mixed-use development
- 2601 Mariposa Street: a 10-foot addition to an existing commercial building (75 feet)
- 681 Florida Street: a nine-story (87/96 feet) mixed-use development
- 2750 19th Street: a six-story (68/78 feet) mixed-use development

These cumulative projects are either approved but unbuilt or under review with the planning department and are close enough to interact with the proposed project or project variants to alter ground-level wind conditions in publicly accessible areas of substantial pedestrian use near the project site. The wind study model used project plans where available; however, for some cumulative projects, final plans were not available and simplified massing models were used.

See **Table 3.F.1**, p. 3.F.13, for a summary of the test results and **Figure 3.F.4: Wind Hazard Results – Cumulative Scenario**. When compared to existing conditions, the cumulative scenario would increase the number of test points that would exceed the hazard criterion and the number of hours per year that winds would exceed the hazard criterion. Implementation of the cumulative scenario would change wind patterns such that three new exceedances (test points 1, 11, and 28) would be created and all existing hazard exceedances would remain (test points 44, 48, and 49), resulting in a net change of three new exceedances.

The same two test points that would newly exceed the hazard criterion under the project scenario (test points 1 and 11) would also exceed the hazard criterion under the cumulative scenario. One additional exceedance of the hazard criterion would be created west of the project site at the northeast corner of the 17th/Florida streets intersection (test point 28) under the cumulative scenario. All three hazard exceedances along the east sidewalk of Hampshire Street would also remain under cumulative conditions as under existing conditions, with the location furthest south on Hampshire Street (test point 49) reappearing as a hazard exceedance unlike the project scenario under which it was eliminated.



Source: RWDI, March 2020

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FIGURE 3.F.4: WIND HAZARD RESULTS – CUMULATIVE SCENARIO

Although test point 28 did not appear as a project-specific new hazard exceedance, the proposed project or project variants could interact with other cumulative development in the immediate vicinity of that test point (321 Florida Street, 2435-2445 16th Street, and 1850 Bryant Street) due to its proximity (approximately 200 feet to the west) and its size in relation to other proposed buildings to create a significant cumulative impact to which it may contribute considerably. The new hazard exceedances at test points 1 and 11 are clearly attributable to the proposed project or project variants. Therefore, under the cumulative scenario a net increase of one new hazard exceedance would be caused by interactions of the proposed project or project variants with cumulative development, as the hazard exceedance at the intersection of 17th and Florida streets would not occur under the project scenario.

In summary, under the cumulative scenario six test points would exceed the hazard criterion, compared to three test points with existing conditions and four test points under the project scenario. The total number of hazard exceedance hours would increase to 76 hours, compared to the 58 hours per year under existing conditions and 86 hours per year under the project scenario.

For the reasons above, the proposed project or project variants, in combination with cumulative projects in the vicinity, would have a significant cumulative wind impact, and the proposed project or project variants would make a cumulatively considerable contribution to a significant cumulative wind impact. However, with implementation of the design measures discussed above (introduction of porous façades, a recessed corner, street trees) in **Mitigation Measure M-WI-1**, test results indicate the following for the cumulative scenario:

- Wind hazard exceedances under the mitigated cumulative scenario would be reduced from six to two with test point 44 remaining a hazard exceedance, test point 47 eliminated, a new hazard exceedance at test point 48, and no hazard exceedances at test points 1, 11, and 28. The total number of hours the wind hazard criterion would be reached or exceeded would decrease by 65 hours, from 76 hours per year under the unmitigated cumulative scenario to 11 hours per year.

Therefore, with mitigation, the proposed project's or project variants' contribution to cumulative wind impacts would be reduced to a less-than-significant level. No additional mitigation measures are necessary.

G. SHADOW

INTRODUCTION

EIR Section 3.G, Shadow, addresses the shadow impacts of the proposed project or project variants on publicly accessible open spaces and recreation facilities in the vicinity of the project site. The Environmental Setting discussion identifies existing publicly accessible open spaces in the site's vicinity and describes existing shadows on existing publicly accessible open spaces. The Regulatory Framework specifies the City's applicable regulations related to shadow and solar access. The Impacts discussion analyzes whether the proposed project or project variants would shade parks and open spaces in a manner that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. The Impacts subsection also evaluates the potential for the proposed project or project variants to combine with cumulative projects in the vicinity, resulting in potentially cumulative shadow effects. The analysis, calculations, and shadow diagrams have been prepared by PreVision Design, an independent shadow consultant, as part of a San Francisco Planning Code (planning code) section 295-compliant shadow study for the proposed project.[1] The shadow study prepared for the proposed project is the primary source of information for this EIR section (see **EIR Appendix I)**.

Issues identified in response to the Notice of Preparation (NOP) of an EIR and Notice of Public Scoping Meeting (**EIR Appendix A**) related to the proposed project's physical environmental impacts were considered in preparing this analysis. The San Francisco Planning Department (planning department) received general comments related to shadow effects (see **EIR Chapter 1, Introduction**, pp. 1.3-1.5).

ENVIRONMENTAL SETTING

EXISTING OPEN SPACE NEAR THE PROJECT SITE

The only publicly accessible outdoor open space within the northeast portion of the Mission District that is potentially within reach of the proposed project's or project variants' shadow is Franklin Square.[2] (See **Figure 2.1: Project Site Location**, p. 2.4, in **EIR Chapter 2, Project Description**.) This open space is under the jurisdiction of the San Francisco Recreation and Park Commission (recreation and park commission) and is subject to the provisions of the Sunlight Ordinance, as

[1] PreVision Design, Shadow Analysis Report for the Proposed SFMTA Potrero Yard Project Per CEQA and San Francisco Planning Section 295 Standards, April 12, 2021 (see **EIR Appendix I**).

[2] This determination was made based on PreVision Design's shadow fan (presented below under "Approach to Analysis," p. 3.G.10) which shows the maximum reach of project shadow throughout the entire day and entire year. In Chaan Kajal, a recreation and park commission property at Folsom and 17th streets, and the Utah and 18th Mini-Park (also a recreation and park commission property) are not within the reach of project shadow under planning code section 295. They are therefore eliminated from further review of shadow impacts.

articulated in planning code section 295 (discussed below under "Regulatory Framework," pp. 3.G.7-3.G.9).

Franklin Square

Franklin Square is a 4.44-acre (193,327 square feet) public park under the jurisdiction of the San Francisco Recreation and Park Commission (recreation and park commission) and the San Francisco Recreation and Park Department (recreation and park department). The rectangular open space is located in the northeast portion of the Mission neighborhood on Assessor's Block 3963, Lot 001. It is bounded by 16th Street to the north, 17th Street to the south, the mapped but unbuilt Hampshire Street to the east (right-of-way currently used for parking), and Bryant Street to the west. The park hours of operation are from 5 a.m. to 12 a.m. (midnight).

Existing land uses in the vicinity of Franklin Square include the Potrero Center retail complex to the north, the project site (Potrero Yard) to the south, commercial uses to the east, and a mix of residential and retail/commercial uses to the west.

Park Features

Franklin Square is a landscaped open space directly north of the project site on a prominent serpentine rock outcrop bounded by concrete retaining walls and above the grade of surrounding streets and sidewalks, e.g., along 16th Street. Originally a landscaped Victorian park developed in the late 1890s with large areas of grass, trees, and meandering paths, it was completed after the 1906 Earthquake. In 1984 a large soccer field was added to the park. Franklin Square now features a large fenced-in soccer field[3] at its center and a gated children's play area near the southwest corner of the park (see **Figure 3.G.1(a): Franklin Square Amenities** and **Figure 3.G.1(b): Franklin Square Children's Play Area Detail**).

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[3] Use of this recreational facility is reserved through the recreation and park department as a "permit only" facility in use between 8 a.m. and 10 p.m. daily. It is typically reserved by various youth and adult athletic clubs and school groups.

Source: PreVision Design, 2021

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FIGURE 3.G.1(a): FRANKLIN SQUARE AMENITIES

Source: PreVision Design, 2020

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FIGURE 3.G.1(b): FRANKLIN SQUARE CHILDREN'S PLAY AREA

As shown on **Figure 3.G.1(a)**, outside the perimeter of the soccer field, there are grassy and landscaped areas, picnic areas with benches, paved walkways and benches, public restrooms, and an adult fitness area and parcourse, which are not fenced. The vegetation and landscaping outside of the soccer field primarily consists of open grassy areas punctuated by mature trees varying in height from 10 to 30 feet with dense tree canopies along the park's western edge and southwestern corner, with smaller saplings along the northern, southern, and western edges. The principal entries to the park are located on the corners of 16th and Bryant streets and 17th and Bryant streets, with an additional stairway and Americans with Disabilities Act entry located mid-block along 17th Street between Bryant and Hampshire streets. Parking is provided along the eastern edge in the Hampshire Street right-of-way. The soccer field, children's play area, and other park amenities and infrastructure have been improved over time, with the most recent renovations to the athletic area, parcourse, and lighting.[4]

CHILDREN'S PLAY AREA

As shown on **Figure 3.G.1(b)**, The children's play area, along the south-central portion of park, is fenced and consists of multiple play structures and areas with surrounding benches, tables, and landscaping. This provides a separated activity area for children and seating for adults who supervise them. The play structures and areas include jungle gyms, merry-go-rounds, slides, swings, sculptural animal structures for climbing, and a replica train and tracks. The children's play area is set back from 17th and Bryant streets, to the south and east, respectively, and is visually separated by pathways and a landscaped area.

Park Use

Franklin Square has consistent demand throughout the year due to its location in an increasingly dense mixed-use neighborhood with a deficiency of open spaces[5] and ease of access by public transit. People pass through the park and use the park in a variety of ways, including use of the soccer field and children's play area by nearby schools and childcare centers. PreVision Design conducted 30-minute observations at Franklin Square during the morning, midday, and afternoon on February 27, 2020, and March 1, 2020.[6] Observations noted that the park is used throughout the day, with a concentration of users during the times when the soccer field is reserved, and in the morning and afternoons when the park is used for activities such as walking/exercising, dog walking, and playing in the children's play area. During these times, the number of users in the park ranged from approximately 39 to 176, with the two principal destinations of park users being

[4] San Francisco Recreation and Parks Department, Franklin Square Improvement Project, *https://sfrecpark.org/1140/Franklin-Square-Improvement-Project*, accessed December 15, 2020.

[5] San Francisco Planning Department, Mission Area Plan, *https://generalplan.sfplanning.org/Mission.htm#MIS_SOS*, accessed December 15, 2020.

[6] Two site visits were performed in the morning, two at midday, and two late in the day, with one visit from each pair on a weekday and one on a weekend.

the soccer field and the children's play area. Users of the soccer field (both as game participants and observers) accounted for most park users. The children's play area was also observed to be used across all visits, with the number of users ranging from one on the weekday afternoon visit to 18 (six adults and 12 children) observed on the weekend morning visit. Overall, observed peak use at the park occurred during weekend morning and midday hours. The observed intensity of use varied between the observation times but could be characterized as high for the soccer field, moderate for the children's playground, and low for other park features.

Existing Shadow on Park

Based on historic San Francisco weather patterns, the times of the year with the most sunshine and the lowest levels of rain and/or fog are spring and fall. The height limits surrounding Franklin Square vary from 85 feet to the north, 65 feet to the south, 65 to 68 feet to the east, and 55 to 85 feet to the west. Existing buildings to the north across 16th Street, the east toward Potrero Avenue, the west toward Florida Street, and the south across 17th Street range from one- to nine-story story buildings (with the tallest at 95 feet including permitted elements such as parapets and penthouse enclosures). These existing buildings cast shadow on Franklin Square. As a result, the east and west sides of the park are generally shadowed in the morning, sunny during midday, and shadowed during the afternoon. The north, central, and southern portions of the park are generally sunny throughout the middle of the day year-round.

OTHER OPEN SPACE

Privately Owned Public Open Space

The nearest privately owned public open space (77 South Van Ness Avenue) is located approximately 1 mile to the northwest and is not within the reach of the project shadow.

No other open space, community gardens, or other types of outdoor community-serving facilities or privately owned public open spaces are located in the immediate project vicinity and within the potential reach of project shadow.

Public Sidewalks and Streets

There is a complete network of public sidewalks on both sides of the streets that bound the project site – 17th, Hampshire, Mariposa, and Bryant streets – as well as the project vicinity. Existing buildings typically cast shadows throughout the day and throughout the year on adjacent and nearby sidewalks. In general, the public sidewalks and streets in the project vicinity are shadowed in the early morning and the late afternoon and receive the greatest amount of sunlight during the middle of the day, with more shading occurring in the fall and winter, when the sun is lower on the horizon. However, the sidewalks along 17th and Bryant streets and immediately adjacent to the project site

are generally not shaded because the predominantly single-story structure is located on the eastern half of the site, i.e., there is no building frontage along 17th and Bryant streets.

REGULATORY FRAMEWORK

SAN FRANCISCO GENERAL PLAN

The San Francisco General Plan (general plan) contains objectives and policies that are related to preserving sunlight on open spaces and other public areas. These objectives and policies are found in the Recreation and Open Space Element (ROSE), the Urban Design Element, as well as applicable area plans.

Recreation and Open Space Element (ROSE)

Policy 1.9 in the general plan's ROSE states:

> Solar access to public open space should be protected. In San Francisco, presence of the sun's warming rays is essential to enjoying open space. Climatic factors, including ambient temperature, humidity, and wind, generally combine to create a comfortable climate only when direct sunlight is present. Therefore, the shadows created by new development nearby can critically diminish the utility and comfort of the open space.
>
> Shadows are particularly a problem in downtown districts and in neighborhoods immediately adjacent to the downtown core, where there is a limited amount of open space, where there is pressure for new development, and where zoning controls allow tall buildings. But the problem potentially exists wherever tall buildings near open space are permitted.
>
> Properties under the jurisdiction of the Recreation and Park Department or designated for acquisition are protected by a voter-approved Planning Code amendment. It restricts the construction of any structure exceeding forty feet in height that would cast a shadow that is adverse to the use of the park from between one hour after sunrise to one hour before sunset, unless it is determined that the impact on the use of the space would be insignificant. In determining whether a new shadow cast by a development is adverse to the use of a particular property, the City considers several quantitative and qualitative criteria, including the size of the park property, the amount of existing shadow, and the timing, size, location, and duration of the new shadow and the public good served by the building.
>
> The City should support more specific protections elsewhere to maintain sunlight in these spaces during the hours of their most intensive use while balancing this with the need for new development to accommodate a growing population in the City.

Urban Design Element

Policy 3.4 in the general plan's Urban Design Element calls for the promotion of building forms that will respect and improve the integrity of open spaces and other public areas. Buildings to the

south, east, and west of parks and plazas should be limited in height or effectively oriented so as not to prevent the penetration of sunlight to such parks and plazas. Large buildings and developments should, where feasible, provide ground-level open space on their sites, well situated for public access and for sunlight penetration.

Mission Area Plan

Objective 5.3 of the Mission Area Plan describes the creation of a network of "Green Connector" streets in the Mission District, including 17th Street, that connect open spaces and improve walkability, aesthetics, and ecological sustainability of the Mission. The objective also emphasizes pedestrian connections between the Mission District and other neighborhoods that foster an enjoyable pedestrian environment by minimizing shade, maximizing sidewalk width, and providing amenities such as lighting and street furniture. Existing primary pedestrian connections include those along 16th Street and 24th Street, and the objective identifies Potrero Avenue for inclusion as a primary pedestrian connection.

Policy 5.3.7 identifies the Mission Public Realm Plan (also called the Mission District Streetscape Plan, drafted in October 2010) as the document to detail the differing design needs of different types of streets in the Mission. **Policy 3.1.2** states that the design of new, mixed-use infill development in the Northeast Mission Industrial Zone should strengthen the area's industrial character through appropriate materials, massing, and setback. Finally, **Policy 3.1.12** requires height limits and upper-story setbacks along alley frontages to maintain adequate light and air to sidewalks.

SAN FRANCISCO PLANNING CODE

Section 101.1

In November 1986, the voters of San Francisco approved Proposition M (the Accountable Planning Initiative), which added section 101.1 to the planning code and established eight Priority Policies. These Priority Policies shall be the basis upon which inconsistencies in the general plan are resolved. Priority Policy No. 8 calls for the protection of parks and open space and their access to sunlight and vistas.

Prior to issuing a permit for any project which requires an initial study under CEQA; prior to issuing a permit for any demolition, conversion, or change of use; and prior to taking any action which requires a finding of consistency with the general plan, the City is required to find that the proposed project or legislation would be consistent with the Priority Policies.

Section 147

Planning code section 147, added in 1985, establishes additional design guidelines for new buildings and additions in C-3 Downtown Commercial, South of Market Mixed Use, and Eastern Neighborhoods Mixed Use Districts where the height exceeds 50 feet. It requires such projects to be shaped to minimize shadow on public plazas and other publicly accessible spaces other than those protected under planning code section 295 (described below). The amount of area shadowed, the duration of the shadow, and the importance of sunlight to the type of open space being shadowed are important factors to consider when determining compliance with this criterion.

Section 295

In 1984, San Francisco voters approved an initiative known as "Proposition K, The Sunlight Ordinance," which was codified in 1985 as planning code section 295 (section 295). Section 295 prohibits the approval of "any structure that would cast any shade or shadow upon any property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission" unless the San Francisco Planning Commission (planning commission), with review and comment by the recreation and park commission, has found that the shadows cast by a proposed project would not have an adverse impact on the use of the property. Section 295 does not apply to structures that do not exceed 40 feet in height. The period analyzed is from the first hour after sunrise until the last hour before sunset.

On February 7, 1989, pursuant to Proposition K, the planning commission and the recreation and park commission adopted a joint resolution adopting criteria for determination of significant shadows in 14 downtown parks, as described in a February 3, 1989, memorandum to the planning commission and the recreation and park commission regarding "Proposition K, The Sunlight Ordinance." These criteria establish an "absolute cumulative limit" (ACL) for new shadow allowed on these parks, as well as qualitative criteria for allocating the ACL among individual development projects. The ACL for a particular park is expressed as a percentage of the theoretical annual available sunlight on that park. The difference between the ACL and the amount of existing shadow on a particular park is commonly referred to as the "shadow budget" for that park. The shadow budget is then allocated to individual projects within the ACL based on qualitative criteria established for each park, which vary by park but may include factors such as the time of day, the time of year, shadow characteristics (size, duration, location), and the public good served by the building casting the shadow.

The planning commission and the recreation and park commission have not established an ACL for new shadow on Franklin Square.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLDS

The threshold for determining the significance of impacts in this analysis is consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable threshold is used.

A project would result in a significant shadow impact if the project would:

- Create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces.

The thresholds for determining the significance of shadow impacts in San Francisco pursuant to CEQA and section 295 are different. The significance threshold for environmental review addresses a broader array of shadow-related considerations that may include not only quantitative criteria, but also how affected open spaces are used; time of day and/or time of year of use and/or shadowing; physical layout and facilities affected; the intensity, size, shape, and location of the shadow; and the proportion of open space affected. If the planning department determines, based on these factors, that the use of an affected open space or recreational facility would be substantially and adversely affected, then the impact would be significant for the purposes of CEQA. There may be situations under which new shadow that would be considered significant under section 295 would not have a significant environmental impact under CEQA because quantity of net new shadow is only a part of the consideration used in the evaluation of a shadow's significance.

The determination as to whether the proposed project complies with section 295 would occur independently of this EIR's analysis and evaluation of shadow impacts. The purpose of the analysis in this EIR is to provide the public and City decision-makers with information that sufficiently describes the proposed project's shadow in terms of the types of parks and open spaces that it would affect, when and where the shadow would occur, what the anticipated duration of the shadow would be, and whether the shadow could substantially and adversely affect any activities or uses in the subject parks or open spaces.

APPROACH TO ANALYSIS

Project Features

The project site is currently occupied by the existing predominantly single-story maintenance and operations building and asphalt-paved bus yard on the east and west portions of the site, respectively. The grade elevation of the development changes approximately 27 feet from the lowest southwest corner to the highest northeast corner.

A new transit facility with residential and commercial components would be constructed on the 4.4-acre site, replacing the predominantly single-story maintenance and operations building and asphalt-paved bus yard. It would comprise two volumetric components: a three-level, 75-foot-tall podium element for the new transit facility, which would occupy the full site except for a 5-foot-wide planting strip along the northern property line, and three- to seven-story residential structures atop the podium rising to an overall height of 150 feet, as measured along Mariposa Street, not including the elevator or mechanical room enclosures. (See **Figure 2.4: Proposed Massing – South (Mariposa Street) Elevation, Figure 2.5: Proposed Massing – West (Bryant Street) Elevation, Figure 2.6: Proposed Massing – North (17th Street) Elevation**, and **Figure 2.7: Proposed Massing – East (Hampshire Street) Elevation**, pp. 2.25-2.28, in **EIR Chapter 2, Project Description**.) The proposed building may cast shadow on parks, recreational facilities, and publicly accessible spaces in the vicinity of the site. The tallest portions of the new residential development atop the transit facility podium would be located on the southern portion of the site, which would minimize shadow impacts on Franklin Square. (See **Figure 2.19: Proposed Joint Development Floors 7-13**, p. 2.43.)

The proposed project would include construction of pedestrian streetscape improvements to adjacent sidewalks and streets as well as new open space on the rooftop of the proposed transit facility podium, along its northern portion where the residential structures are set back from the property line. This new open space may be available to the public but is now currently contemplated as open space for use by building residents and the SFMTA employees.

The proposed project also includes four project variants as described in **EIR Chapter 2, Project Description**, pp. 2.56-2.58. The proposed building position, height, and bulk/massing of the project variants would be the same as those of the proposed project. Therefore, shadow impacts of the project variants would be identical to those of the proposed project and no separate analysis of the project variants is necessary.

Technical Standards

The shadow study prepared by PreVision Design for the proposed project follows the criteria adopted by the recreation and park commission and the San Francisco Planning Commission in 1987 and 1989 (see **EIR Appendix I**). As stated,

> "Shadow is quantitatively measured by multiplying the area of the shadow by the amount of time the shadow is present on the open space, in units called square-foot-hours (sfh). Determining the annual net new shadow load generated by a project begins with a calculation of the number of square foot-hours [of sunlight] that would theoretically fall on a qualifying publicly accessible open space each day from an hour after sunrise to an hour before sunset summed over the course of a year, ignoring all shadow from any source. This total is referred to as the Theoretical Annual Available Sunlight (TAAS) for that park. The second step is the calculation of the baseline (or current) shading conditions, which factors in the square foot-hours of shadow cast by existing buildings and other structures on the open space. Lastly, the shadow effects of

> the project are calculated, with the difference between the baseline shadow condition and project shadow condition considered being net new project shadow. The amount of shadow is defined as the shadow in square foot-hours cast by the project divided by the TAAS, expressed as a percentage.
>
> "Further, in addition to quantitative criteria, the adopted criteria set forth qualitative criteria for evaluation of shadow. Those criteria for assessing net new shadow are based on existing shadow profiles [graphics], important times of day, important seasons in the year, location of the net new shadow, size, and duration of net new shadows and the public good served by buildings casting net new shadow."

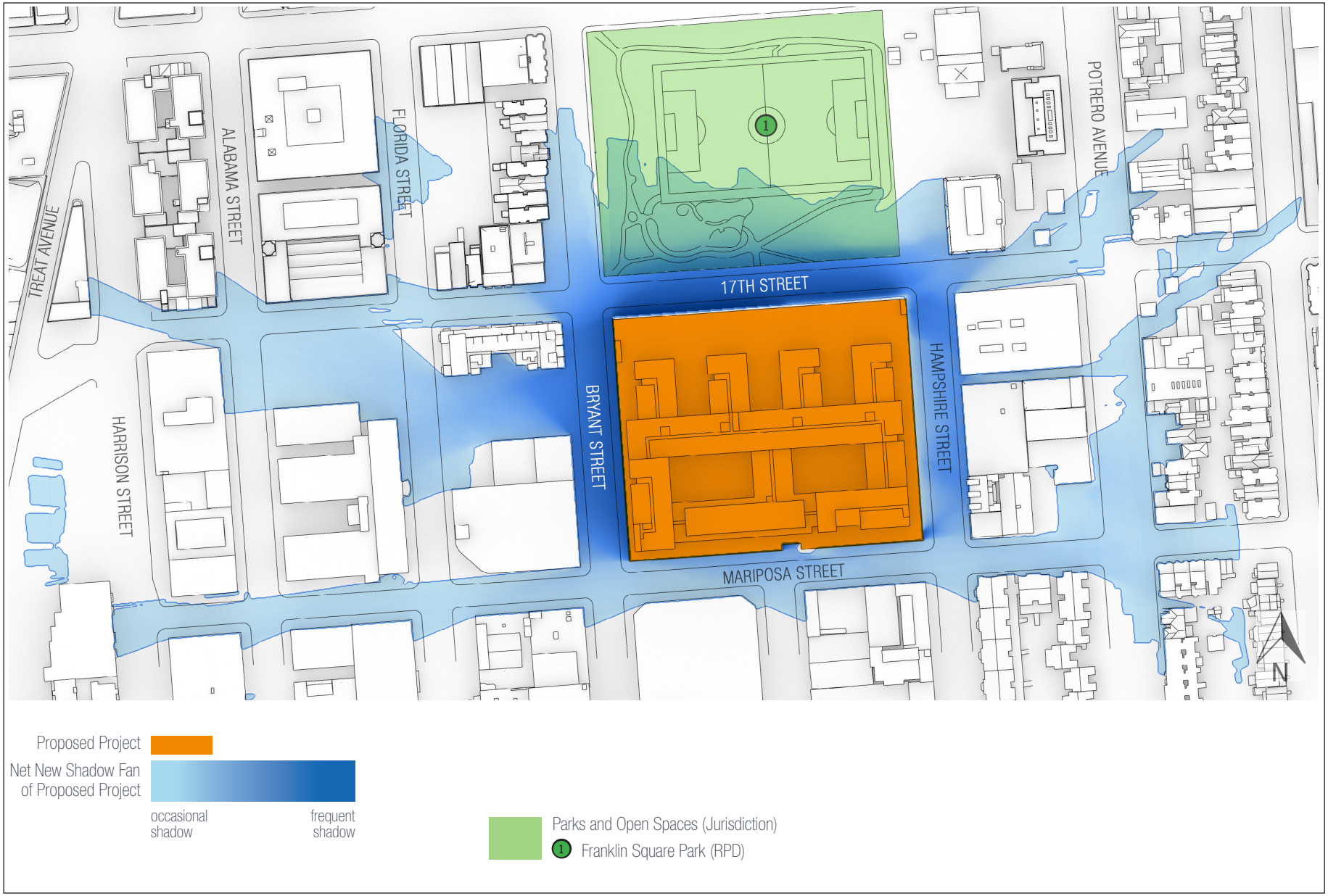
The quantitative and qualitative analyses described above were performed for both Franklin Square as a whole and, in a breakout analysis, the children's play area in Franklin Square in particular.

Shadow Fan

In order to determine whether any properties under the jurisdiction of the recreation and park commission could potentially be affected by project shadow, PreVision Design prepared a "shadow fan" diagram (see **Figure 3.G.2: Net New Shadow Fan in Relation to Franklin Square**). The shadow fan is a tool that plots the maximum potential reach of project shadow over the course of a year (from one hour after sunrise until one hour before sunset for the spring and fall equinoxes and summer and winter solstices) relative to the location of nearby open spaces, recreation facilities, and publicly accessible parks. The shadow fan accounts for topographical variation and existing shadow cast by existing buildings. The shadow fan is used by the planning department as the basis for initially identifying which open spaces, recreation facilities, and parks merit further study. Those that are outside the maximum potential reach of project shadow do not require further study.

Shadow Model

PreVision Design developed a digital shadow model using site survey data and project data that was used to evaluate the project's shadow impacts on Franklin Square. Existing buildings adjacent to and in the vicinity of the affected park were identified and modeled using 2010 LIDAR (Light Intensity Distance and Ranging) data and architectural plans and records for newer buildings. Additionally, to assess the cumulative conditions, PreVision Design obtained or generated 3D models of cumulative projects with potential to generate additional net new shadow on the same publicly accessible open space shown to be affected by the proposed project. The digital model reflects a minimum level of detail and includes only those surrounding buildings that are needed to represent the shadows that could fall on the surface of Franklin Square from one hour after sunrise to one hour before sunset, as defined in section 295.



Source: PreVision Design, 2021

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FIGURE 3.G.2: NET NEW SHADOW FAN IN RELATION TO FRANKLIN SQUARE

Consistent with section 295, for the purposes of describing the timing of shadow impacts on parks in this EIR section, the "beginning of the day" refers to a point in time that is one hour after sunrise on given day. Correspondingly, the "end of the day" refers to one hour before sunset. These times fluctuate throughout the year based on the day and season.

SHADOW CALCULATIONS

The model produces a spreadsheet that quantifies the amount of shadow cast by existing buildings, the amount of net new shadow cast by the proposed project, and the remaining amount of sunlight on the subject open space over the course of a year.[7] Additionally, the same calculations are performed for the cumulative conditions (baseline plus project, and plus cumulative projects). The shadow is measured at 15-minute intervals beginning on the summer solstice and then once a week for half a year until the winter solstice.[8] The shadow calculations serve as the basis for the quantitative discussion of shadow impacts.

SHADOW DIAGRAMS

Using a computer program that accounts for building heights and topography, PreVision Design has prepared shadow diagrams for Franklin Square, which were used to evaluate project shadow impacts. Fog, rain, overcast days, and shadows from trees, existing or proposed, are not taken into account when illustrating existing sources of shadow in these diagrams (notwithstanding that existing shadow from trees may be relevant to how visitors use park facilities). Shadow diagrams are "snapshots" taken at a particular representative time of day and day of the year. They illustrate the extent and location of shadows cast by existing buildings, net new shadow from a proposed building, and areas of sunlight on the subject open space. A "sweep" is a series of shadow diagrams from a particular day that demonstrates how shadows move across a specific space within a certain timeframe. Shadow diagrams may also serve as the basis for the qualitative discussion of shadow impacts because they graphically represent where new shadow may affect open spaces.

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[7] The shadow calculations are included in **EIR Appendix I**. The tables are provided for June 21 to December 20. All other dates in a year match one of these dates and are called "mirror" dates. The mirror date for each day in the tables is listed under the date of the table.

[8] It is not necessary to sample the other half of the year (from the winter solstice to the summer solstice), because shadow behaves symmetrically at the solstices, and yields the same values in reverse order.

PROJECT-SPECIFIC IMPACT EVALUATION

Impact SH-1: The proposed project or project variants would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. (*Less than Significant*)

Franklin Square

Most of Franklin Square is unshaded through the middle of the day (between 10:30 a.m. and 1:30 p.m.) year-round. Existing shadow is cast primarily along its eastern and western sides during early morning and morning timeframes (before 10:30 a.m.) and the afternoon and late afternoon timeframes (after 1:30 p.m.), respectively.

As shown in **Figure 3.G.2**, the proposed project or project variants at 150 feet in height would increase the net new annual shadow on the southern portion of Franklin Square over the course of the year. Net new project shadow would affect pathways, landscape/grass areas, the adult fitness area, the children's play area, and a small portion of the soccer field.

For slightly less than half the year during spring and summer (approximately 24 weeks), the project shadow would not reach Franklin Square at any time of the day. Project shadow would occur annually for approximately 28 weeks between September 14 (around the fall equinox) through March 28 (around the spring equinox). During the affected period, project shadow would be cast throughout the day and would sweep across the southern portion of the park starting in the early mornings, receding at midday, and increasing again in the afternoons. The times of year which would be most affected by project shadow are the fall and winter months in the mornings (between 8 a.m. and 11:00 a.m.). The duration of project-generated net new shadow would vary throughout the year, with the maximum net new shadow occurring in the fall and winter months, with 8 hours and 48 minutes being the longest daily duration. On average, project shadow would have an average daily duration of approximately 6 hours and 13 minutes.

Shadow from the proposed project or project variants would reach its maximum on December 20 and December 21 at 8:19 a.m. when the project shadow would cover an area of 56,153 square feet in the southern portion of the park before receding as the morning progresses. Net new shadow would be present on the park's southwestern corner at 8:19 a.m. (the beginning of the daily analysis period) and sweep across the park from west to east, while also retreating to the south until midday, then encroaching northward into the late afternoon through 3:54 p.m. (the end of the daily analysis period). (See **Figure 3.G.3: Maximum Net New Project Shadow on Franklin Square, 8:19 AM on December 20/December 21**.) Also, on December 20 and December 21 at 8:19 a.m., shadow from existing buildings would cover 38,213 square feet, comprising 20 percent of the park's area. Net new project shadow would cover an additional 29 percent of the park's area at this time, leaving 51 percent of the park in sunlight at that time.

Source: PreVision Design, 2021

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FIGURE 3.G.3: MAXIMUM NET NEW PROJECT SHADOW ON FRANKLIN SQUARE, 8:19 AM ON DECEMBER 20 / DECEMBER 21

As discussed above, new project shadow would occur from September through March in the southern half of the park during the early morning/mornings and in the late afternoons. Park features such as the soccer field, the children's play area, the pathways, landscape and grassy areas as well as the adult fitness area along the southern edge of the park would receive more shadow and for a longer duration with the proposed project development than under existing conditions.

Certain types of activities are more affected by changes in shadow than others. Of the activities that occur in Franklin Square, sitting on benches or seating areas within the children's play area would be more affected by changes in shadow because people would be in a single location for an extended duration. Based on the park use surveys conducted for the shadow study, the soccer field is the space that exhibits the greatest amount of use, followed by the children's play area. Other areas of the park such as the pathways, landscaped and grassy areas, and the adult fitness area at the southwestern corner of the park were less used, or used for transitory purposes such as walking to the soccer field or for jogging.[9] These activities would be less affected by changes in shadow because people typically do not remain at any one location for an extended duration; they are moving between shaded and unshaded portions of Franklin Square. Thus, as the shadow sweeps across the southern portion of the park, shadows caused by the proposed project or project variants would not displace any park users who wish to avoid shadow, as the soccer field would receive only minimal shadow (for approximately 30 minutes in the morning an hour after sunrise) and other park users could move to the northern half of the park. Soccer field usage was observed to be high during the weekend site visit; however, the small area affected would not have had a likely effect on the observed uses. Additionally, at these times, the northern portion of the park would continue to be unshaded by existing and project shadow and would be available to those park users seeking sunlight. Furthermore, the landscape and grassy areas as well as the adult fitness area along the southern edge of the park were observed to have substantially lower levels of use and could be characterized as somewhat less sensitive to the addition of net new shadow due to the observed levels and nature of their uses.

Franklin Square Children's Play Area

The children's play area is 11,075 square feet (approximately 0.25 acre). Under existing conditions, the play area is predominantly unshaded throughout the day and throughout the year, with only very small amounts of shadow occurring in the summer at the eastern edge of the play area in the early morning (before 8:00 a.m.) and at the western edge in the late afternoon.

As shown in **Figure 3.G.2**, the proposed project or project variants at 150 feet in height would increase the net new annual shadow on the children's play area over the course of the year. For slightly more than half the year during spring and summer (approximately 28 weeks), the project

[9] The number of users present in the park over the course of half an hour ranged from 39 to 176 people, with use of soccer field accounting for 50 to 75 percent of use.

shadow would not reach the children's play area at any time of the day. Project shadow would occur annually for approximately 24 weeks between September 28 (around the fall equinox) through March 14 (around the spring equinox). During the affected period, project shadow would be cast throughout the day and would sweep across all parts of the play area starting in the early mornings and again in the late afternoons. The times of year which would be most affected by project shadow are the fall and winter months in the mornings (between 8 a.m. and 11 a.m.). The duration of project-generated net new shadow would vary throughout the year, with the maximum net new shadow occurring in the fall and winter months, with 5 hours and 20 minutes being the longest daily duration. On average, project shadow would have an average daily duration of approximately 2 hours and 28 minutes.

Shadow from the proposed project would reach its maximum on December 20 and December 21 at 8:30 a.m. when the project shadow would cover the whole play area. Net new shadow would be present on the play area starting at 8:19 a.m. (the beginning of the daily analysis period), with maximum coverage at 8:30 a.m. Shadow would cover the entire play area in the early morning and begin to recede southward at 8:45 a.m. and continue receding as the morning progresses. Shadow would move off the play area at approximately 11:15 am, and then return at approximately 1:45 p.m. and sweep across the southern and southeast portions of the play area through the afternoon until 3:54 p.m. (the end of the daily analysis period). (See **Figure 3.G.4: Maximum Net New Project Shadow on Franklin Square Play Area, 8:30 AM on December 20/December 21**.) Net new project shadow would affect all portions of the play area.

As discussed above, new project shadow would occur from September through March on the play area during the early morning/mornings and in the afternoons. All portions of the play area would receive more shadow and for a longer duration with project development than under existing conditions.

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Source: PreVision Design, 2021

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FIGURE 3.G.4: MAXIMUM NET NEW PROJECT SHADOW ON FRANKLIN SQUARE PLAY AREA, 8:30 AM ON DECEMBER 20 / DECEMBER 21

Based on the park use surveys conducted for the shadow study, the children's play area was used across all observation visits. Slightly elevated usage was observed around the morning and midday periods compared to the afternoon periods, and on weekends versus weekdays. Additionally, based on information provided by the recreation and park department, Franklin Square is also regularly used on a daily basis during weekdays by schools and childcare centers in the vicinity.[10] Thus, it is likely that the presence of new shadow would be noticed by users of the play area, particularly during the morning periods across the affected fall and winter months. This effect would be less noticeable to park users in the winter months, which tend to have more rain and/or fog and lower temperatures than the spring and fall months. These environmental factors typically result in lower park usage, especially in the morning hours during winter when children are typically dropped off at schools and/or childcare centers. Users of the play area during this affected period would observe a project shadow that sweeps across the park but does not cover the whole play area except for a short period between 8:19 a.m. and 9:00 a.m. Thus, shadows caused by the proposed project or project variants would not displace any users of the play area who wish to avoid shadow because users could move to the northern portion of the play area as the morning progresses to midday or further out to other areas of the larger Franklin Square. At these times, the northern portion of the play area and other areas of the surrounding park would be unshaded by existing and project shadow and would be available to those park users seeking sunlight.

Conclusion

Implementation of the proposed project or project variants would increase the shadow on Franklin Square including a portion of the soccer field, the children's play area, the adult fitness area, the pathways, and landscape and grass areas along the southern portion of Franklin Square. Based on observed usage of Franklin Square including its soccer field and children's play area -- the two most used park features -- the modeled reach of project shadow would not be expected to adversely affect the use and enjoyment of this public open space. The limited effect of project shadow on park users would be attributable to the limited duration of the shadow during the year (i.e., no project shadow would reach Franklin Square during spring and summer); the period of the year and the limited times of shadow on the days when shadow would reach Franklin Square (i.e., the fall and winter months in the morning hours and late afternoons); the nature of the observed uses (i.e., more active use of park features); and the extent of new shadow (i.e., limited primarily to the southern portion of Franklin Square with the remainder of Franklin Square unshaded). The new shading would be unlikely to affect users of Franklin Square who use it during the midday period and for those who engage in more active recreational activities. For these reasons, project shadow on Franklin Square would have a limited effect on the use and enjoyment of the open space, resulting in a less-than-significant shadow impact. No mitigation measures are necessary.

[10] The New School (K-12) and two childcare centers (Sweet Peas at 2730 17th Street and Project Commotion at 2095 Harrison Street) are located in the project vicinity.

Nearby Sidewalks and Streets

The proposed project or project variants would cast net new shadow on nearby sidewalks and streets throughout the year to the extent that these areas are not already shaded by existing buildings that line streets (see **Figure 3.G.2**, p. 3.G.13). At certain times of day and year, the proposed project or project variants would cast net new shadow on nearby sidewalks, including those along 17th, Bryant, Mariposa, and Hampshire streets.

Net new project shadow on nearby sidewalks would be transitory in nature and would not affect the use and enjoyment of sidewalks in the area, which function primarily as public pathways for pedestrians. Additionally, the Green Connections corridor along 17th Street, immediately north of the project site, is a recreational resource identified in the ROSE. Given that sidewalks are typically used by pedestrians traveling between destinations and not as a recreational resource, the increase in shadowed area for pedestrians and bicyclists traversing the corridor (on the signed bicycle route) would not be adversely affected by additional shadow occurring on one block of a long linear route. Overall, the proposed project or project variants would not increase the amount of shadow on the sidewalks above levels that are common and generally expected in developed urban environments. For these reasons, the proposed project or project variants would have a less-than-significant shadow impact on the use of sidewalks and streets.

CUMULATIVE IMPACT EVALUATION

Impact C-SH-1: The proposed project or project variants in combination with cumulative projects in the vicinity would not create new shadow in a manner that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. The proposed project or project variants would not make a cumulatively considerable contribution to a significant cumulative shadow impact. (*Less than Significant*)

Figure 3.G.5: Cumulative Projects with Net New Shadow on Franklin Square illustrates the following four cumulative projects in relation to Franklin Square:

- 2435-2445 16th Street: a seven-story (78 feet) residential development
- 1850 Bryant Street: a five-story (68 feet) mixed-use development
- 321 Florida Street: a 10-story (107 feet) mixed-use development
- 333-353 Potrero Avenue: a five-story (68 feet) mixed-use development

The cumulative projects are located to the east, west, and southwest of Franklin Square. None are adjacent but all are one block away. These cumulative projects were considered for their potential to create net new shadow that would combine with project shadow on Franklin Square.

Source: PreVision Design, 2020

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FIGURE 3.G.5: CUMULATIVE PROJECTS WITH NET NEW SHADOW ON FRANKLIN SQUARE

Franklin Square

Due to the close proximity of the project site to Franklin Square, shadow caused by the proposed project or project variants would account for the largest shadow load on the park. Shadow from cumulative projects in the vicinity would occur in areas of the park that would also be affected by the proposed project or project variants. The cumulative shadow from other projects would be primarily attributable to the 321 Florida Street project, which would cast shadow on the western and southern portions of park in the summer, fall, and winter in late afternoons (at the end of the daily analysis period). Shadow from the 2435-2445 16th Street project would have a similar shadow pattern as the 321 Florida Street project but shading on the western portion of the park attributable to that project would be very limited due to its proposed height, location, and the presence of existing shadow. Shadow from the 1850 Bryant Street project would reach the southwestern portion of Franklin Square during winter afternoons at the end of the daily analysis period (one hour before sunset). Shadow from the 333-353 Potrero Avenue project would not reach Franklin Square at any time during the year.

Under cumulative conditions, the proposed project or project variants would combine with cumulative projects to cast daily shadow on the park in the morning and afternoons throughout the year. The time of year which would be most affected by cumulative shadow would be the fall and winter months in the mornings (between 8 a.m. and 11:00 a.m.). The duration of cumulative net new shadow would vary throughout the year, with the minimum net new shadow occurring in the summer months (54 minutes) and the maximum net new shadow occurring in the fall and winter months (8 hours and 48 minutes). Under cumulative conditions, the dates with the single largest net new shadow area and the longest shadow duration would occur on the same dates as under project conditions (December 20 and December 21). Similarly, the maximum area and duration of shadow under cumulative conditions would be the same as the maximum area and duration of shadow under project conditions. Thus, maximum net new shadow on the park would also occur December 20 and December 21, when cumulative shadow would fall across the southern half of Franklin Square throughout the day, affecting pathways, landscape and grass areas, the adult fitness area, the children's play area, and portions of the soccer field.

Additional net new shadow from the cumulative projects would also occur in the late afternoon on December 20 and December 21 from 3:15 p.m. to 3:54 p.m. The additional net new shadow would fall on the western and southern portions of the park, affecting pathways, landscape and grass areas, and a small portion of the soccer field for approximately 30 minutes. The northwest corner of the soccer field would receive additional net new cumulative shadow from the 321 Florida Street project. This additional net new cumulative shadow would occur for a short duration (15 minutes or less) in the late afternoon. The southern edge of the park would receive additional net new cumulative shadow from the 1850 Bryant Street project. This additional net new cumulative shadow would also occur for a short duration (30 minutes or less) in the late afternoon. Based on

the park use survey and due to the short duration and small area affected, it is unlikely this shadow would affect the users of the soccer field or the pathways, landscape and grass areas along the park's northwest corner, or the park's western or southern edges.

In addition, the majority of the additional net new cumulative shadow that would be primarily attributable to the 321 Florida Street project would occur in the summer months in the late afternoon near the end of the daily analysis periods (one hour before sunrise). This net new cumulative shadow area would cover 26,903 square feet on the western and southern thirds of the park, representing approximately 14 percent of the total park area. This additional net new cumulative shadow would be present for 55 minutes on average and would last for up to a maximum duration of 1 hour and 11 minutes.

Franklin Square Children's Play Area

Shadow from the 321 Florida Street and 1850 Bryant Street cumulative projects would cause new shadow on the children's play area. Shadow from the 2435-2445 16th Street and 333-353 Potrero Avenue projects would not reach the play area at any time during the year. Cumulative net new shadow from the proposed project or project variants, combined with cumulative projects in the vicinity, would increase the amount of shadow on the play area throughout the year.

Additional net new cumulative shadow on a small area along the play area's southern edge would occur on December 20 and December 21 from the 1850 Bryant Street project but only in the late afternoon around 3:45 p.m. for 15 minutes or less. The additional net new cumulative shadow on the play area from the 321 Florida Street project would occur in the summer months in the late afternoon. This additional net new cumulative shadow would encroach on the western edge of the play area around 7:00 p.m. It would affect more than half of the play area for approximately 30 minutes (between 7:00 p.m. and 7:36 p.m.). The park use survey shows reduced activity in the play area in the late afternoon and early evenings when the additional net new cumulative shadow would occur. However, as existing shadows from existing development are also moving toward the play area at this time, visitors to the play area during the later afternoon/early evening would experience the addition of cumulative shadow as the arrival of shadow on portions of the play area 20 to 30 minutes earlier than experienced under existing conditions.

Conclusion

Implementation of the proposed project or project variants and cumulative projects would increase the shadow on Franklin Square, including a portion of the soccer field, the children's play area, the adult fitness area, the pathways, and landscape and grass areas along the western and southern portions of Franklin Square. Based on observed park usage including its soccer field and children's play area -- the two most used park features -- the modeled reach of cumulative shadow would not be expected to adversely affect the use and enjoyment of this public open space even though

additional net new cumulative shadow would reach the western edge of the park in the summer months in the late afternoon/early evening, a period of generally lower usage.

The limited effect of the additional net new cumulative shadow would be attributable to the duration and timing of the additional shadow (a maximum of 1 hour and 11 minutes during the early evening in the summer), the lower number of park users during the late afternoon and early evening, and the fact that other areas of the park including the play area would be available to visitors. Thus, additional net new cumulative shadow from other projects in the vicinity would not adversely affect the use and enjoyment of this public open space and, when combined with shadow from the proposed project or project variants, would not result in a significant cumulative shadow impact. No mitigation measures are necessary.

Nearby Sidewalks and Streets

The proposed project or project variants in combination with cumulative projects in the vicinity would create net new shadow on nearby streets and sidewalks at times of day and throughout the year when these areas are not already shaded by existing buildings in the area. At certain times of day and year, cumulative shadow would be cast by the proposed project or project variants and cumulative projects on nearby sidewalks, including those along 17th, Bryant, Mariposa, and Hampshire streets.

Most of the sidewalks in this area are already shaded by existing buildings at different times of day and at different times of year. Although implementation of the proposed project or project variants and the cumulative projects would add net new shadow to the sidewalks in the project vicinity, these shadows would be transitory in nature, would not substantially affect the use of the sidewalks, and would not increase shadows above levels that are common and generally expected in a densely developed urban environment. Thus, cumulative shadow impacts on sidewalks in the area would be considered less than significant for the same reasons that project-level shadow impacts would be considered less than significant.

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4. OTHER CEQA CONSIDERATIONS

EIR Chapter 4, Other CEQA Considerations, discusses growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, and areas of known controversy related to the proposed project or project variants.

A. GROWTH-INDUCING IMPACTS

As required by section 15126.2(d) of the California Environmental Quality Act (CEQA) Guidelines, an environmental impact report (EIR) must consider the ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing impacts can result from the elimination of obstacles to population growth, such as a major expansion of a wastewater treatment plant, or through economic growth that would, in turn, generate increased employment or demand for housing and public services.

The transit component of the proposed project or project variants is part of the San Francisco Municipal Transportation Agency's (SFMTA's) Building Progress Program, and the replacement transit facility is one of the outcomes from the agency's comprehensive outreach to SFMTA staff and stakeholders (see "Project Background," starting on p. 2.15 of **EIR Chapter 2, Project Description**). The SFMTA's planning process is part of an integrated approach premised on transit fleet plan projections developed in coordination with the Association of Bay Area Governments' (ABAG's) regional economic, land use, and population projections for 2040 and the San Francisco County Transportation Authority's travel demand model for the City.[1] Therefore, the transit components of the proposed project or project variants would not directly induce population growth.

The project site is in a priority development area (PDA) as designated by ABAG, specifically the Eastern Neighborhoods PDA.[2] PDAs are locally identified areas that are located near transit and have infill development opportunities; they are part of a regional planning initiative led by ABAG and the Metropolitan Transportation Commission (MTC). The initiative links land use and transportation planning and promotes a connected and more compact land use pattern. Under the initiative, future growth in the region would be focused in the community-identified PDAs. PDAs are also important components of Plan Bay Area, which is the regional planning effort undertaken in response to the Sustainable Communities Strategy (Senate Bill 375), a state law passed in 2008. Plan Bay Area focuses much of the region's projected growth within the PDAs. San Francisco

[1] SFMTA, 2014 SFMTA Transit Fleet Management Plan, March 2014, pp. 3-4.
[2] MTC and ABAG, Priority Development Areas (Plan Bay Area 2050). July 15, 2020, *https://opendata.mtc.ca.gov/datasets/priority-development-areas-plan-bay-area-2050?geometry=-126.461%2C37.142%2C-118.117%2C38.659,* accessed May 13, 2021.

elected officials and agency staff have participated in the Sustainable Communities Strategy development process since its inception, and the San Francisco Planning Department (planning department) updates the City's long-range land use allocation every four years based on the most recent ABAG forecast for the Sustainable Communities Strategy.

As stated under **Impact PH-1**, initial study p. 20, the proposed project or project variants would add 575 new housing units, accommodating approximately 1,357 new residents and 548 net new jobs to the project site (see **EIR Appendix B**). The growth projections prepared by ABAG for Plan Bay Area's Projections 2013 and updated in May 2019 for San Francisco County anticipate a population of 1,169,485 people in 2040 (an increase of 360,340 people between 2010 and 2040) and 872,510 jobs in 2040 (an increase of 295,660 jobs between 2010 and 2040). As described on initial study p. 21, the population increase attributable to the proposed project or project variants would represent about 0.4 percent of the projected population growth between 2010 and 2040 for San Francisco; and the employment increase attributable to the proposed project or project variants would represent about 0.2 percent of the employment growth projected between 2010 and 2040 for San Francisco. Therefore, the proposed project or project variants would not make up a substantial portion of citywide growth, and the population and employment increases would be accommodated within planned growth. As described on initial study pp. 21 and 22, the 575 new housing units would represent between 4.3 and 4.7 percent of the projected household growth in the Eastern Neighborhoods PDA (with a projected increase of 12,170 households between 2010 and 2040), while the 548 new jobs would represent 5.6 percent of the employment growth projected for the Eastern Neighborhoods PDA (with a projected increase of 9,820 jobs) over the same period.[3]

The estimated population of the City and County of San Francisco in 2019 was approximately 881,549 residents.[4] When compared to existing conditions, the proposed project or project variants would represent an incremental increase in the local population. However, this population growth would not be substantial or unplanned, as no expansion of roads or other public infrastructure related to energy, water supply or wastewater/stormwater collection and conveyance system expansions, or public services would be needed to accommodate the project-related population. Additionally, the proposed project's approximately 1,357 residents would represent a small fraction of the expected increase in population Citywide, as projected in Plan Bay Area. Therefore, the proposed project or project variants would not induce unplanned population growth; rather, the proposed project or project variants would accommodate the need for housing within the City.

[3] MTC and ABAG, Plan Bay Area Final Forecast of Jobs, Population and Housing, Appendix B: Housing Growth by Jurisdiction and PDA, July 2013, p. 58, *http://files.mtc.ca.gov/library/pub/28450.pdf*, accessed March 26, 2021.

[4] U.S. Census Bureau, QuickFacts, San Francisco County, California, Population and Housing Unit Estimates for San Francisco County, California, 2010-2019, https://www.census.gov/quickfacts/sanfranciscocountycalifornia, accessed May 7, 2021.

In ABAG's Projections 2013, San Francisco is projected to have an estimated 1.32 workers per household.[5] As discussed on initial study p. 23, the proposed project or project variants would result in an increase in Citywide employment with the addition of 548 jobs for the new transit facility and new residential and commercial uses. The proposed project's or project variants' employees would generate a potential demand for about 415 new residential units; this employee-generated housing demand would represent less than 1 percent[6] of projected household growth between 2010 and 2040, if all these employees relocated to San Francisco and required new housing. Such a small increase in employee-generated housing demand would not necessitate the construction of new housing in itself and would not constitute substantial unplanned growth. Furthermore, the new housing that would be developed with the proposed project would contribute new units to the City's housing stock and could potentially accommodate some of the new employment-related housing demand.

As evaluated in initial study **sections E.12, Recreation, E.13, Utilities and Service Systems,** and **E.14, Public Services**, the proposed project or project variants would not require the expansion of roads, public infrastructure, or public services that would accommodate additional increased development opportunities offsite that could cause additional offsite physical changes to the environment (see **EIR Appendix B**).

In summary, the increase in the number of residents and employees on the project site would not result in a substantial or unplanned increase in the population of the Eastern Neighborhoods PDA or the City. Furthermore, the proposed project or project variants would not result in the extension of infrastructure into undeveloped areas; the extension of infrastructure systems beyond what is needed to serve project-specific demand; construction of a residential project in an area that is undeveloped or sparsely developed; or removal of obstacles to population growth (such as provision of major new public services to an area where those services are not currently available).

B. SIGNIFICANT UNAVOIDABLE IMPACTS

In accordance with section 21100 (b)(2)(A) of CEQA and with sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify significant environmental impacts that could not be eliminated or reduced to less-than-significant levels by implementation of mitigation measures.

The proposed project or project variants would result in the significant and unavoidable project-level impacts described below.

[5] ABAG, *Projections 2013,* pp. 74 and 75.

[6] With 548 new onsite employees and 1.32 workers per household, there would be an increase of approximately 415 households (548 ÷ 1.32), compared to the Plan Bay Area-projected increase of 137,885 households between 2010 and 2040. The 415 households represent 0.3 percent of 137,885, which is less than 1 percent.

Historic Architectural Resources (EIR Section 3.B)

As identified in **EIR Section 3.B, Historic Architectural Resources**, under **Impact CR-1**, pp. 3.B.29-3.B.32, demolition of the post-earthquake reinforced concrete car barn at 2500 Mariposa Street, designed by master Michael M. O'Shaughnessy, under the proposed project or project variants would result in a significant and unavoidable impact. The Potrero Trolley Coach Division Facility has been determined as eligible for inclusion in the California Register of Historical Resources under Criterion 1 (Events) and Criterion 3 (Architecture/Design/Construction) and is considered a historic resource under CEQA. Implementation of **Mitigation Measures M-CR-1a: Documentation of Historical Resource**, **M-CR-1b: Salvage Plan**, **M-CR-1c: Interpretation of the Historical Resource**, and **M-CR-1d: Oral Histories**, pp. 3.B.29-3.B.32, would lessen the impact of the proposed project; however, these mitigation measures would not reduce this impact to a less-than-significant level. Therefore, this impact would be considered significant and unavoidable.

Air Quality (EIR Section 3.E)

As identified in **EIR Section 3.E, Air Quality**, under **Impact AQ-3**, pp. 3.E.52-3.E.59, construction and operation of the proposed project or project variants would result in significant and unavoidable impacts related to exposure of sensitive receptors to substantial pollution concentrations resulting in excess cancer health risk exposure. Implementation of **Mitigation Measure M-AQ-1: Off-Road Construction Equipment Emissions Minimization** and **Mitigation Measure M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan**, pp. 3.E.47-3.E.48 and p. 3.E.57, respectively, would lessen the impact of the proposed project or project variants; however, **Mitigation Measure M-AQ-1** may not reduce the construction-related contributions to emissions of toxic air contaminants resulting in excess cancer health risk exposure of sensitive receptors under project and cumulative conditions. **Mitigation Measure M-AQ-3** would reduce the operation-related contribution to the excess cancer health risk exposure.

Project contributions to emissions of toxic air contaminants such as diesel particulate matter for construction and operational phases would be attributable to the number and types of construction equipment, the number of construction truck trips, the addition of three onsite emergency diesel generators, and, to a lesser extent, increased vehicle trips attributable to construction workers and the proposed land uses. The air quality mitigation measures, which would effectively reduce modeled project contributions to below the significance criterion for excess cancer health risk exposure (i.e., 7 parts per million), are premised on construction emissions from information provided by the SFMTA, i.e., the number and types of construction equipment, expected duration of average daily use, and the number of construction truck trips; some (or all) of which may increase. Thus, even with implementation, the proposed project or project variants could generate toxic air contaminants that result in excess cancer health risk exposure to sensitive receptors. The

project-level and cumulative air quality impacts associated with excess cancer health risk exposure would therefore remain significant and unavoidable with mitigation.

EIR Chapter 5, Alternatives, presents a range of alternatives (Alternative A: No Project Alternative; Alternative B: Full Preservation Alternative, Alternative C: Partial Preservation Alternative, and Alternative D: Transit Facility Plus Commercial Only Alternative) that would meet most of the project objectives and could avoid or substantially lessen one or more of the significant impacts of the demolition and site redevelopment under the proposed project or project variants. The chapter includes preservation alternatives that would retain, in whole or in part, historic character-defining features of the project site and a reduced density alternative that would develop a smaller project primarily focused on the replacement of the transit facility. Alternative A: No Project Alternative would avoid all impacts of the proposed project or project variants. The historic preservation alternatives (Alternatives B and C) would each avoid or substantially lessen the significant historic architectural resource impact, the significant air quality impacts, and one or more other significant impacts that were identified for the proposed project or project variants. Alternative B would not cause material impairment to the resource and, unlike the proposed project or project variants, would not result in a significant and unavoidable impact related to demolition of a historical resource or excess cancer health risk. The transit facility plus commercial only alternative (Alternative D) would also reduce one or more significant and unavoidable impacts, e.g., air quality impacts, but would not avoid or substantially lessen the significant historic architectural resource impact.

C. SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

In accordance with section 21100(b)(2)(B) of CEQA and section 15126.2(c) of the CEQA Guidelines, an EIR must identify any significant irreversible environmental changes that could result from implementation of the proposed project. This may include uses of non-renewable resources during the initial and continued phases of a project that may be irreversible as a large commitment of resources makes removal or non-use thereafter unlikely, and secondary impacts that commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with a project. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified.

The project site is currently an urban site developed with one building and an asphalt-paved bus storage yard that would be redeveloped as a new transit facility with residential and commercial joint development components. As such, no irreversible environmental changes, such as those that might result from construction of a large-scale mining project, hydroelectric dam, or other industrial

project that specifically alters non-renewable resources, would result from development of the proposed project or project variants.

No significant irreversible environmental damage related to environmental accidents is anticipated to occur with implementation of the proposed project or project variants. Compliance with federal, state, and local regulations related to the handling, transport, and disposal of hazardous materials during demolition, construction, and operation of the new transit facility, as well as the limited hazardous materials associated with the operation of the new residential and commercial joint development uses, would reduce the potential for the proposed project or project variants to cause significant irreversible environmental damage. (See **Section E.18, Hazards and Hazardous Materials**, of the initial study in **EIR Appendix B**.)

Consumption of nonrenewable resources includes increased energy consumption, conversion of agricultural lands to urban uses, and loss of access to mineral reserves. No agricultural lands would be converted and no access to mining reserves would be lost with construction of the proposed project or project variants. (See **sections E.19, Mineral Resources**; **E.20, Energy**; and **E.21, Agriculture and Forestry Resources**, of the initial study in **EIR Appendix B**.)

Resources consumed during construction would include lumber, concrete, gravel, asphalt, masonry, metals, and water. Similar to the existing uses on the project site, the proposed project or project variants would irreversibly use water and solid waste landfill resources. However, the proposed project or project variants would not involve a large commitment of resources relative to existing conditions or supply, nor would it consume any of those resources wastefully. (See S**ection E.12, Utilities and Service Systems**, of the initial study in **EIR Appendix B**.)

The proposed project or project variants would not include service by a natural gas provider; however, operation of the proposed project or project variants would require the use of energy, including energy produced from nonrenewable fossil fuels. In California, energy consumption in buildings is regulated by Title 24 of the California Code of Regulations. Title 24 includes standards that regulate energy consumption for the heating, cooling, ventilation, and lighting of residential and nonresidential buildings. In San Francisco, documentation demonstrating compliance with Title 24 standards is required to be submitted with a building permit application. Compliance with Title 24 standards is enforced by the San Francisco Department of Building Inspection. The proposed project (or project variants) is an infill development that would include new construction on a developed site. The proposed project or project variants would be required to comply with the standards of Title 24 and the requirements of the 2019 San Francisco Green Building Ordinance. Because the proposed project or project variants would be required to meet or exceed the energy conservation requirements in the San Francisco Green Building Ordinance, which itself includes energy conservation requirements that exceed those in the California Building Code, energy would

not be used in a wasteful, inefficient, or unnecessary manner. (See **sections E.9, Greenhouse Gas Emissions** and **E.20, Energy**, of the initial study in **EIR Appendix B**.)

The new transit facility would continue to store and maintain the all-electric trolley bus fleet and non-revenue vehicles as well as diesel- and gasoline-fueled buses and non-revenue vehicles. Thus, operation-related energy consumption for the new transit facility would include a limited amount of diesel and gasoline fuels associated with the operation and maintenance of SFMTA's bus fleet and non-revenue vehicles, and three new emergency generators. Additionally, fossil fuel consumption for the proposed project or project variants would include vehicle fuel used by residents, employees, and visitors of the transit facility and joint development components as expressed through vehicle miles traveled. Electricity for the all-electric trolley bus fleet and non-revenue vehicles would be part of the operation-related energy-consumption for the new transit facility upon occupancy and re-initiation of transit service. As noted above, in the short term some non-revenue diesel- or gasoline-fueled vehicles would continue to be stored and maintained. The SFMTA's expected conversion of both its revenue and non-revenue fleet and its storage and maintenance yards, divisions, and facilities is expected to increase over time as the Muni transitions to an all-electric fleet by the year 2035. Operation-related energy-consumption would also include electricity used for building space heating and lighting (uses that are covered by Title 24, discussed above) as well as for operation of equipment and machines, for both the new transit facility and joint development components. (See **sections E.9, Greenhouse Gas Emissions** and **E.20, Energy**, of the initial study in **EIR Appendix B**.)

Energy conservation design features to meet state and local goals for energy efficiency and renewable energy have been incorporated into the project design to reduce wasteful, inefficient, and unnecessary consumption of energy during construction and operation. The proposed project or project variants would be built to Leadership in Energy and Environmental Design Gold certification, thus minimizing the amount of fuel, water, or energy used. The rooftops would be developed with a mix of green roof and/or solar photovoltaic systems. The proposed project or project variants would also incorporate transportation demand management measures into its design, such as 12 car-share parking spaces and bicycle parking, that would help to minimize the amount of transportation fuel consumed. (See **Section E.9, Greenhouse Gas Emissions** of the initial study in **EIR Appendix B**.)

The proposed project or project variants would introduce residential and commercial uses to the project site as joint development components. As discussed in the initial study under **Section E.13, Utilities and Service Systems**, p. 53, the project site is within an urban area that is served by water storage, treatment, and distribution facilities; combined wastewater and stormwater collection, storage, treatment, and disposal facilities; and solid waste collection and disposal service systems (see **EIR Appendix B**). The proposed project or project variants would use best-practice water conservation devices and techniques. On October 27, 2020, the San Francisco Public Utilities Commission approved a water supply assessment for the proposed project or project variants and

determined that adequate water supplies are available to meet project demand and cumulative retail water demand in normal and wet years (roughly nine out of ten years), with systemwide rationing required in dry years (approximately one out of ten years). Additionally, the relatively small volume of water demand generated by the proposed project or project variants would not exacerbate any projected shortfalls if the Bay-Delta Plan Amendment is implemented. Because the water demand estimated for the proposed project or project variants could be accommodated by the existing and planned supply anticipated under the commission's 2015 Urban Water Management Plan, it would not result in a substantial increase in water use on the project site such that existing water supply entitlements and water resources would need to be expanded. Furthermore, the project sponsor and general contractor would minimize the use of potable water during construction to the extent feasible, and would comply with Ordinance 175-91, which requires that non-potable water be used for dust-control activities when feasible. The proposed project or project variants would not involve the wasteful, inefficient, or unnecessary consumption of water resources. (See **sections E.13, Utilities and Service Systems**, and **E.17, Hydrology and Water Quality**, of the initial study in **EIR Appendix B**.)

D. AREAS OF KNOWN CONTROVERSY AND ISSUES TO BE RESOLVED

EIR Chapter 1, Introduction, describes the public review process and summarizes the comments received on the Notice of Preparation (NOP) of an Environmental Impact Report and Notice of a Public Scoping Meeting. During the NOP public scoping period, a total of eight comments were provided: one speaker provided oral comments at the virtual public scoping meeting held on September 2, 2020, and seven comment letters and emails were submitted to the planning department.

To the extent the comments received on the NOP relate to environmental issues, they are addressed in the EIR and initial study. Any comments related to project merits that cannot be addressed through the CEQA process will be provided to decision-makers as part of the entitlement process. Controversial issues for the proposed project, as expressed by community members and agency stakeholders, include the following:

- Rehabilitation of the existing site as an alternative
- Reevaluation of the need for the project given 2020 changes in housing and transit demand due to the COVID-19 response
- Preservation of the existing onsite historical architecture
- Impacts to bicyclists, including accident rate changes
- Noise impacts on residents
- Impacts to the industrial uses in the Mission District neighborhood
- Impacts related to affordable housing in the project vicinity and rent increases

- Impacts on neighborhood characteristics such as the existing architectural character that includes small manufacturing, live-work lofts, and historic buildings
- Parking for Muni workers in the project vicinity and impacts on Muni workers as well as businesses and residents in the vicinity
- Wind and shadow impacts on residents
- Impacts on Franklin Square due to the increased number of local residents and employees
- Impacts on birds, including nesting birds
- Artificial lighting impacts on wildlife

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5. ALTERNATIVES

A. INTRODUCTION

EIR Chapter 5, Alternatives, presents an analysis of alternatives to the Potrero Yard Modernization Project at 2500 Mariposa Street, as required by the California Environmental Quality Act (CEQA). This chapter is divided into four main sections: Section A, Introduction; Section B, Description and Analysis of Alternatives; Section C, Environmentally Superior Alternative; and Section D, Alternatives Considered but Rejected.

Section A, Introduction, presents a discussion of the CEQA requirements for the analysis of alternatives to the proposed project or project variants. It lists the project objectives, provides a summary of significant impacts, and delineates the CEQA-compliant alternatives screening and selection process used to develop a reasonable range of potentially feasible project alternatives that could avoid or substantially lessen the significant impacts identified in this environmental impact report (EIR) for the proposed project or project variants while still meeting most of the project's basic objectives.

Section B, Description and Analysis of Alternatives, identifies each of the selected alternatives, contrasts the characteristics and impacts of the selected alternatives with those of the proposed project or project variants, evaluates the ability of each alternative to meet most of the project's basic objectives, and provides a detailed description of the selected alternatives and an analysis of the selected alternatives' environmental impacts. Because the impacts of the proposed project are substantially the same as those for each of the four project variants, the alternatives impact analysis does not include a separate comparative analysis for project variants. Three of the project variants—the Emergency Exit Relocation Variant, the Active 17th Street Variant, and the Employee and Family Support Variant—would be feasible variants with any of the alternatives. As described below, the Joint Development Lobby Relocation Variant would not be a feasible variant with any of the project alternatives. (See **EIR Chapter 2, Project Description**, pp. 2.56-2.58, for a detailed description of each of the project variants.) Therefore, for purposes of this alternatives chapter, references to project variants are to the three feasible variants.

Four alternatives are evaluated: a No Project Alternative (Alternative A), two historic preservation alternatives (Alternative B: Full Preservation Alternative and Alternative C: Partial Preservation Alternative), and a Transit Facility Plus Commercial Only Alternative (Alternative D). **Table 5.1: Comparison of Characteristics of the Proposed Project and EIR Alternatives**, pp. 5.18-5.22, compares the main characteristics of the proposed project to the alternatives. More detailed discussion of each alternative is presented in Section B, starting on p. 5.15.

Following the analysis of the alternatives, Section C, Environmentally Superior Alternative, identifies the environmentally superior alternative among the alternatives considered. The

environmentally superior alternative is generally defined as the alternative that would result in the least adverse environmental impacts to the project site and affected environment. Section D, Alternatives Considered but Rejected, discusses alternatives that were considered but rejected by the lead agency and identifies the reasons for their elimination from detailed consideration in the EIR.

ALTERNATIVES SELECTION

This discussion describes the methodology used to select alternatives to the proposed project or project variants for detailed CEQA analysis, with the intent of developing potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified in **EIR Chapter 3, Environmental Setting and Impacts**, and in the initial study (**EIR Appendix B**) while still meeting most of the project's basic objectives. The proposed project or project variants would adversely affect a historic architectural resource by demolishing the maintenance and operations building and all its character-defining features (see **EIR Section 3.B, Historic Architectural Resources**, p. 3.B.13). Construction of the proposed project or project variants would also result in significant air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure under project and cumulative conditions[1] (see **EIR Section 3.E, Air Quality**, pp. 3.E.52-3.E.59 and 3.E.65-3.E.67**)**. The impact to the historic architectural resource and the air quality impacts were the only significant and unavoidable impacts identified. As a result, historic preservation alternatives and one reduced density project alternative (addressing air quality impacts) have been developed that would avoid or substantially lessen such significant and unavoidable impacts while still meeting most of the project's basic objectives. This chapter identifies a reasonable range of alternatives, including historic preservation alternatives and a reduced density alternative addressing air quality impacts (health risk), that fulfill CEQA criteria and evaluates the alternatives for their comparative abilities to meet most of the project's basic objectives and avoid or substantially lessen significant environmental effects that would occur with the proposed project or project variants.

CEQA REQUIREMENTS FOR ALTERNATIVES ANALYSIS

CEQA Guidelines section 15126.6(a) states that an EIR must describe and evaluate a reasonable range of alternatives to the proposed project or project variants that would feasibly attain most of its basic objectives but avoid or substantially lessen any identified significant environmental effects of the proposed project or project variants. The EIR must include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project or project variants. An EIR is not required to consider every conceivable alternative to a proposed

[1] The air quality analysis regarding health risk impacts prepared for the proposed project and project variants demonstrated the air quality health risk impact was below the significance threshold. However, given that the construction equipment list and assumptions modeled are preliminary, there is uncertainty such that this impact has been identified as a significant air quality impact.

project or project variants. Rather, it must consider a reasonable range of potentially feasible alternatives to foster informed decision-making and public participation.

CEQA, the CEQA Guidelines, and case law on the subject have found that feasibility can be based on a range of factors and influences. CEQA Guidelines section 15364 defines "feasibility" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." CEQA Guidelines section 15126.6(f)(1) states that the factors that may be taken into account when addressing the feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (if the site is not already owned by the proponent). CEQA Guidelines section 15126.6(f)(3) states that an EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." The final determination of feasibility will be made by City and County of San Francisco (City) decision-makers based on substantial evidence in the record, which includes, but is not limited to, information presented in the EIR, comments received on the Draft EIR, and responses to those comments.

In addition, the range of alternatives considered in an EIR must include a no project alternative (CEQA Guidelines section 15126.6(e)(1)) and an environmentally superior alternative (CEQA Guidelines section 15126.6(e)(2)). The CEQA Guidelines provides the following direction about no project alternatives:

- The no project alternative analysis shall "discuss the existing conditions…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and policies and consistent with the available infrastructure and community services." (section 15126.6(e)(2))
- In an EIR on "a development project on identifiable property, the 'no project' alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed." Thus, "…where failure to proceed with the project would not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment." (section 15126.6(e)(3)(B))

The environmentally superior alternative is the alternative that best avoids or lessens any significant impacts of the proposed project or project variants, even if the alternative would impede to some degree attainment of the project objectives or would be more costly (CEQA Guidelines section 15126.6(b)). If it is determined that the "no project" alternative would be the environmentally

superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (CEQA Guidelines section 15126.6(e)(2)).

- An EIR must also identify and briefly discuss any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process (CEQA Guidelines section 15126.6(c)). In identifying alternatives, primary consideration is given to alternatives that would reduce significant impacts while still meeting most of the basic project objectives. Alternatives typically rejected from further consideration are those that would have impacts identical to or more severe than the proposed project or project variants or those that would not meet most of the basic project objectives.

PROJECT OBJECTIVES

CEQA Guidelines section 15124 states that the description of the project shall contain the following information but should not supply extensive detail beyond that needed for evaluation and review of the environmental impact." Among the basic informational requirements is a statement of objectives sought for the proposed project or project variants. CEQA Guidelines section 15124(b) clarifies the need for this requirement as follows:

> "…A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project and may discuss project benefits."

As stated in the CEQA Guidelines, alternatives to a project selected for analysis in an EIR must substantially lessen or avoid any of the significant environmental impacts associated with the proposed project or project variants while still meeting most of the project's basic objectives. The San Francisco Municipal Transportation Agency (SFMTA) has identified seven basic objectives and seven additional objectives for the Potrero Yard Modernization Project.

Basic Objectives

1) Rebuild, expand, and modernize the SFMTA's Potrero Bus Yard by 2026 to efficiently maintain and store a growing Muni bus fleet according to the SFMTA Fleet Plan and Facilities Framework schedule.
2) Construct the first SFMTA transit facility with infrastructure for battery electric buses to facilitate Muni's transition to an all-electric fleet, in accordance with San Francisco and California policy.
3) Construct a new public asset that is resilient to earthquakes and projected climate change effects, and provides a safe, secure environment for the SFMTA's employees and assets.
4) Improve working conditions of the SFMTA's workforce of transit operators, mechanics, and front-line administrative staff through a new facility at Potrero Yard.
5) Achieve systemwide master plan priorities by consolidating two currently scattered transit support functions at Potrero Yard:

- Improve and streamline transit operator hiring by consolidating the SFMTA's operator training function in a new, state-of-the-art facility.
- Support efficient Muni operations by consolidating the Street Operations division in a modern, convenient facility.

6) Implement inclusive and transparent stakeholder engagement in designing this project and completing the CEQA process.

7) Create a development that is financially feasible, meaning that the public asset can be funded by public means and public transportation funds are used only for the bus yard component.

Additional Objectives

8) Enhance safety and reduce conflicts between transit, commercial vehicles, bicyclists, drivers, and pedestrians in the project site vicinity.

9) Improve the architectural and urban design character of the project site by replacing the existing fences and blank walls with more active, transparent street walls, to the extent feasible.

10) Maximize the reuse of this 4.4-acre site in a central, mixed-use neighborhood by creating a mixed-use development and providing dense housing and striving to maximize the number of affordable units on the site.

11) Increase the City's supply of housing by contributing to the Mayor's Public Lands for Housing goals, the San Francisco General Plan Housing Element goals, and the Association of Bay Area Governments' Regional Housing Needs Allocation for San Francisco by optimizing the number of dwelling units, including affordable housing, particularly near transit.

12) Support transit-oriented development and promote the use of public transportation through an innovative and comprehensive transportation demand management program.

13) Ensure that joint development is able to fund its own construction and ongoing management without reliance on City subsidy other than what is originally assumed as part of the project budget while ensuring that SFMTA's transportation funds are only allocated for the transit use.

14) Demonstrate the City's leadership in sustainable development by constructing an environmentally low-impact facility intended to increase the site's resource efficiency.[2]

The ability of each of the selected alternatives to achieve the basic and additional project objectives is discussed briefly in Section B, Alternatives Analysis, after the description and analysis of each of the alternatives.

[2] The proposed project or project variants and each of the selected alternatives would be designed and constructed to meet the United States Green Building Council and Leadership in Energy and Environmental Design (LEED) requirements at the Gold level.

SUMMARY OF SIGNIFICANT IMPACTS

As stated in the CEQA Guidelines, project alternatives must avoid or substantially lessen significant impacts of the proposed project or project variants. The significant impacts of the proposed project or project variants identified in **EIR Chapter 3** and in the initial study (**EIR Appendix B**) are summarized below.

Significant and Unavoidable Impacts

As identified in **EIR Section 3.B**, the proposed project or project variants would result in the following significant and unavoidable historic architectural resources and air quality impacts after implementation of **Mitigation Measures M-CR-1a: Documentation of Historical Resource**, **M-CR-1b: Salvage Plan**, **M-CR-1c: Interpretation of the Historical Resource**, and **M-CR-1d: Oral Histories**, pp. 3.B.29-3.B.32; and **Mitigation Measures M-AQ-1: Off-Road Construction Equipment Emissions Minimization** and **M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan** (pp. 3.E.47-3.E.48 and p. 3.E.57, respectively:

Historic Architectural Resources (EIR Section 3.B)

- The proposed project or project variants would cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5 of the CEQA Guidelines. (*See **Impact CR-1** [substantial change in the significance of a historic resource due to demolition of a historic structure] on pp. 3.B.29-3.B.32.*)

Air Quality (EIR Section 3.E)

- Construction and operation of the proposed project or project variants would generate toxic air contaminants, including DPM [diesel particulate matter], at levels which would expose sensitive receptors to substantial pollutant concentrations. (*See **Impact AQ-3** [project contribution to substantial pollutant concentrations such as DPM, TOG, and $PM_{2.5}$ and excess cancer health risk exposure] on pp. 3.E.52-3.E.59.*)
- The proposed project or project variants, in combination with cumulative projects in the vicinity, would contribute considerably to cumulative health risk impacts on sensitive receptors. (*See **Impact C-AQ-1** [cumulatively considerable contribution to significant cumulative health risk impact] on pp. 3.E.65-3.E.67.*)

Significant Impacts Mitigated to Less-Than-Significant Levels

The proposed project or project variants would have the following potentially significant impacts, all of which could be mitigated to a less-than-significant level with implementation of identified mitigation measures, as described in detail in **EIR Chapter 3** and in the initial study (**EIR Appendix B**):

Noise (EIR Section 3.D)

Construction of the proposed project or project variants would generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the San Francisco Noise Ordinance or applicable standards of other agencies. (*See **Impact NO-1** on pp. 3.D.34-3.D.44.*)

- Construction of the proposed project or project variants would generate excessive groundborne vibration or groundborne noise levels. (*See **Impact NO-2** on pp. 3.D.44-3.D.47.*)
- Operation of the proposed project or project variants would generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan, or applicable standards of other agencies. (*See **Impact NO-3** on pp. 3.D.48-3.D.51.*)
- Construction noise as a result of the proposed project or project variants, combined with construction noise from cumulative projects in the vicinity, would cause a substantial temporary increase in ambient noise levels. (*See **Impact C-NO-1** on pp. 3.D.52-3.D.53.*)
- Operation of the proposed project or project variants, combined with operation noise from cumulative projects in the vicinity, would cause a substantial permanent increase in ambient noise levels in the project vicinity. (*See **Impact C-NO-2** on pp. 3.D.53-3.D.56.*)

Air Quality (EIR Section 3.E)

- During construction, the proposed project or project variants would not generate significant fugitive dust emissions, but would generate criteria air pollutant emissions at levels which would result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment. (*See **Impact AQ-1** on pp. 3.E.41-3.E.49.*)

Wind (EIR Section 3.F)

- The proposed project or project variants would create wind hazards in publicly accessible areas of substantial pedestrian use in the vicinity of the project site. (*See **Impact WI-1** on pp. 3.F.10-3.F.17.*)

Tribal Cultural Resources (initial study topic E.5)

- Construction of the proposed project or project variants could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074. *(See **Impact TCR-1**, initial study pp. 36-38 **[EIR Appendix B]**.)*
- The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative tribal cultural resources impacts. *(See **Impact C-TCR-1**, initial study p. 38 **[EIR Appendix B]**.)*

Geology and Soils (paleontological resources) (initial study topic E.16)

- The proposed project or project variants could directly or indirectly destroy a unique paleontological resource or site. *(See **Impact GE-6**, initial study pp. 104-109 **[EIR Appendix B]**.)*

ALTERNATIVES SCREENING

In accordance with CEQA Guidelines section 15126.6(a), this EIR examines a reasonable range of alternatives to the proposed project or project variants, or to the location of the project. An alternative selected for analysis must meet three criteria: (1) the alternative would attain most of the project's basic objectives, (2) the alternative would avoid or substantially lessen the significant environmental impacts of the proposed project or project variants, and (3) the alternative would be potentially feasible. As discussed on p. 5.3, an EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative but must consider a reasonable range of alternatives to foster informed decision-making and public participation.

Screening Process

The alternatives selection process for the proposed project or project variants identified alternatives that would avoid or substantially lessen the significant and unavoidable historic architectural resource impact. The alternatives selection process also considered a reduced density alternative to address the significant and unavoidable air quality impacts associated with the exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk. In most cases where impacts were determined to be less than significant with mitigation, alternative strategies were not warranted because feasible and effective mitigation measures have been identified for avoiding those significant impacts. The alternatives considered were then reviewed for their feasibility, and the potentially feasible alternatives were then screened for their ability to meet most of the basic project objectives.

This process resulted in development of the final or selected project alternatives, which were determined to represent a reasonable range of alternatives to the proposed project or project variants. As described below, the alternatives selected for detailed analysis included a comprehensive range of historic preservation alternatives, including a full preservation alternative and partial preservation alternative. Additionally, a reduced density alternative was selected to specifically address the significant and unavoidable air quality impacts.

Alternatives to Avoid or Substantially Lessen Significant Impacts

The only significant and unavoidable impacts identified for the proposed project or project variants, as summarized above, would be the demolition of the historic maintenance and operations building (the Potrero Trolley Coach Division Facility) and the exposure of sensitive receptors to substantial pollutant concentrations under project and cumulative conditions. Impacts on historic architectural resources would be avoided or substantially lessened by retaining all or some of the historical resource proposed for demolition, and rehabilitating the retained historical resource for modern transit vehicle entry/exit requirements consistent with The Secretary of the Interior's Standards for

the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (Secretary's Standards).[3] The no project alternative would avoid this impact. As described below, the preservation alternatives would develop a building similar in scale to the proposed project or project variants (i.e., rising to 150 feet including a 75-foot-tall transit facility podium), but would cover less of the 4.4-acre site on the ground floor due to the retained historic resource and would have less floor area for each floor so as to allow proper setbacks of new construction from the retained historic resource.

The significant and unavoidable air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure would be lessened by limiting the scale of construction. The no project alternative would avoid this impact. Each preservation alternative would constitute a reduced density alternative and have a reduced construction program that could lessen the significant and unavoidable air quality impacts related to excess cancer health risk exposure. Similarly, an alternative, which would replace the transit facility with an expanded and upgraded transit facility and include the ground-floor commercial use without residential uses, would also be a reduced density alternative. This alternative would have a substantially reduced construction program compared to the project or other alternatives that would substantially lessen the excess cancer health risk exposure associated with project implementation.

Preservation Alternatives

San Francisco Planning Department (planning department) staff, in coordination with the SFMTA and the transit facility design and urban design team (HDR and Sitelab), outlined various approaches to the retention of enough of the on-site historic structure so that it would remain recognizable as an early 20th-century car barn, in particular from the corner of Mariposa and Hampshire streets, and therefore retain sufficient integrity as an individual resource eligible for listing in the California Register under Criteria 1 and 3. Primary attention was focused on the retention of character-defining features present during the period of significance (1915-1948) that convey the site's historical significance under Criterion 1 (Events) for its association with the early days of the San Francisco Municipal Railway, and in particular the expansion of Muni service south of Market Street, and Criterion 3 (Design/Construction) as an example of a type (municipal car barn), period of construction (post-earthquake/World War I), method of construction (reinforced-concrete), as well as the "work of a master," City Engineer Michael M. O'Shaughnessy.[4]

[3] U. S. Department of the Interior, National Park Service (Kay D. Weeks and Anne E. Grimmer), The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstruction of Historic Buildings, 1995, *https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf*, accessed March 11, 2021.

[4] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, California, October 2, 2017, Appendix A - DPR 523 A and B Forms for San Francisco Municipal Railway Potrero Car Barn, June 12, 2008. See **EIR Appendix D-1**.

Furthermore, approaches to relating new construction to the retained historical resource were outlined in the development of preservation alternatives with respect to the height and bulk of new construction and setbacks from the retained historical resource.

The development of preservation alternatives focused primarily on avoiding or lessening the substantial adverse change to character-defining features of the historical resource. In addition, existing site constraints were also considered for these alternatives to evaluate whether an alternative was feasible and capable of meeting most of the basic project objectives. Such considerations include the following: the need for providing efficient horizontal and vertical bus circulation, the need for providing sufficient storage of the transit fleet (buses and non-revenue vehicles), the requirements for providing improved maintenance working areas, and the operational requirements for providing a transit facility with adequate and seismically safe infrastructure for a fleet of new battery electric buses and non-revenue vehicles, as well as the existing fleet.

Multiple preservation alternatives were therefore explored to determine (1) if the significant impact of the demolition of the existing historical resource could be avoided or substantially lessened, and (2) if the massing of new construction could be sculpted and/or oriented to limit effects on the retained historical resource and to retain critical transit facility functions as much as possible and achieve the SFMTA's additional objectives related to development of onsite housing. Thus, the range of alternatives considered in this EIR represents the continuation and expansion of the transit facility and the introduction of joint development uses, including new residential uses atop the transit facility podium. The range of alternatives also includes Alternative D, a transit facility and commercial use only alternative that does not propose residential development atop the transit facility podium. Although Alternative D would not avoid or substantially lessen the identified significant and unavoidable historic architectural resource impact of the proposed project or project variants, it would avoid or substantially lessen the identified significant and unavoidable air quality impacts as required under CEQA. Further, Alternative D would provide City-decisionmakers and the public an understanding of the impacts attributable to the transit facility with commercial uses only, i.e., in the event that the residential component of the joint development would not be developed.

HISTORIC PRESERVATION COMMISSION

On October 7, 2020, in order to solicit early input on the development of CEQA-related, preservation-focused alternatives, the planning department and the SFMTA requested review and comment on the proposed preservation alternatives by the Historic Preservation Commission

(HPC) pursuant to HPC Resolution No. 0746.[5,6] The preservation alternatives presented to the HPC reflected considerations of the character-defining features of the existing maintenance and operations building, the ability to meet the project's basic and additional objectives, and potential feasibility, and are described below.[7] See **Figure 5.1(a): Character-Defining Features of the Potrero Trolley Coach Division Facility** and **Figure 5.1(b): Character-Defining Features of the Potrero Trolley Coach Division Facility** for photographs of the Potrero Trolley Coach Division Facility and its character-defining features. Also see **EIR Appendix D** for the Historic Resource Evaluation and Parts I and II of the Historic Resource Evaluation Response.

The HPC reviewed full and partial preservation alternatives that focused on retaining the historic resource's character-defining features, most of which are associated with the office wing of the maintenance and operations building (office wing) along Mariposa and Hampshire streets on the southeast portion of the site. Under the full preservation alternative presented to the HPC, the existing office wing along with the east elevation of the maintenance shops wing (shops wing) along Hampshire Street would be retained. The new transit facility would be constructed on the remainder of the project site. This would require demolition of a portion of the shops wing to the north of the retained office wing and west of east elevation of the retained shops wing. New construction would be set back from the north and west edges of the retained office wing and from the retained east elevation of the shops wing along Hampshire Street, with additional setbacks for development atop the transit facility podium. Under the partial preservation alternative, the office wing would also be retained; however, the shops wing would not be retained. New construction would be developed with shallower setbacks from the north and west edges of the retained office wing and no setbacks from Hampshire Street, north of the retained office wing.

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[5] HPC Resolution No. 0746 (approved March 15, 2015) clarifies expectations for the evaluation of significant impacts to historic resources and the preparation of preservation alternatives in a Draft EIR.

[6] San Francisco Planning Department, Memo to the Historic Preservation Commission, Hearing Date: October 7, 2020, Case No. 2019-021884ENV, 2500 Mariposa Street (Potrero Yard), re: Review and Comment on Preservation Alternatives for Draft EIR, October 7, 2020.

[7] See **Table 3.B.1**, p. 3.B.13, in **EIR Section 3.B, Historic Architectural Resources**, for the final list of character-defining features as identified in the planning department's Historic Resource Evaluation Response, Part I, 2500 Mariposa Street, September 25, 2020 (see **EIR Appendix D-2**, p. 4).

Image 1: View northeast of office wing primary façade along Mariposa Street.

Image 2: View northwest of office wing primary façade along Mariposa Street (left), and secondary façade along Hampshire Street (right).

Image 3: View northwest of secondary façade along Hampshire Street. Note the change in parapet height where the office wing (left) meets the shops wing (right).

Image 4: View southwest of shops wing secondary façade along Hampshire Street. Phototaken from the corner of Hampshire Street and 17th Street.

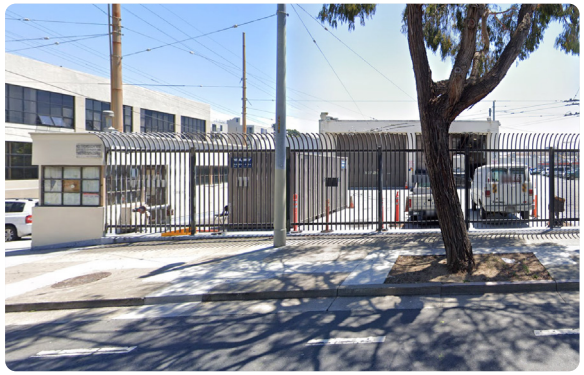
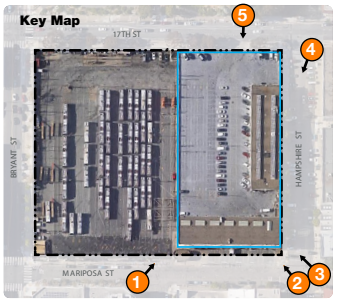


Image 5: View south of shops wing tertiary façade along 17th Street.



Character-Defining Features

- Overall height and massing of the two-story office wing and the remaining portions of the original shops wing along Hampshire Street, including its flat roof
- Fenestration pattern on office wing (Mariposa and Hampshire Streets only) consisting of large vehicular openings at the first floor and groups of three double-hung metal windows at the second-floor level
- Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire Streets, including re-entrant corner detailing, pilaster separating the vehicular openings and door hoods, molded intermediate cornice, continuous lug sill beneath the windows, shallow cornice, and medallion featuring original Muni logo. Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street
- Remaining pedestrian door surround on Hampshire Street façade of office wing with inscription above
- Remaining door trim on westernmost vehicular bay on Mariposa Street
- Surviving double-hung, six-over-six, metal windows on office wing
- Flagpole

Source: SITELAB urban studio

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 5.1(a): CHARACTER-DEFINING FEATURES OF THE POTRERO TROLLEY COACH DIVISION FACILITY

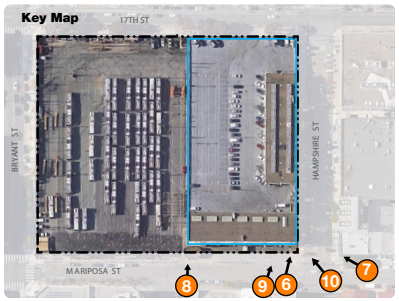
Image 6: Detail view of office wing primary façade. Note character defining features including molded concrete and cement plaster ornament, fenestration pattern of groups of three double-hung metal windows, medallion featuring original Muni logo, and flagpole

Image 7: Detail view of office wing secondary façade. Note character-defining features including molded concrete and cement plaster ornament, reentrant corner detailing, double-hung metal windows, and pedestrian door surround.

Image 8: Detail view of office wing primary façade. Note character-defining features include remaining door trim of westernmost bay.

Image 9: Detail view of office wing primary façade. Note character-defining features include large vehicular openings, double-hung windows, and medallion featuring original Muni logo.

Image 10: Detail view of office wing's primary (Mariposa Street) and secondary façades (Hampshire Street). Note character-defining features include the fenestration pattern of groups of three double-hung metal windows at the second floor level with a continuous lug sill, large vehicular openings at the first floor, reentrant corner detailing, and the flagpole.



Character-Defining Features

- Overall height and massing of the two-story office wing and the remaining portions of the original shops wing along Hampshire Street, including its flat roof
- Fenestration pattern on office wing (Mariposa and Hampshire Streets only) consisting of large vehicular openings at the first floor and groups of three double-hung metal windows at the second-floor level
- Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire Streets, including re-entrant corner detailing, pilaster separating the vehicular openings and door hoods, molded intermediate cornice, continuous lug sill beneath the windows, shallow cornice, and medallion featuring original Muni logo. Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street
- Remaining pedestrian door surround on Hampshire Street façade of office wing with inscription above
- Remaining door trim on westernmost vehicular bay on Mariposa Street
- Surviving double-hung, six-over-six, metal windows on office wing
- Flagpole

Source: SITELAB urban studio

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 5.1(b): CHARACTER-DEFINING FEATURES OF THE POTRERO TROLLEY COACH DIVISION FACILITY

The HPC's comments on the proposed preservation alternatives were summarized in a review and comment memo dated October 15, 2020.[8] The HPC agreed with a preservation approach that focused on retaining and rehabilitating the existing office wing, which is the location of most of the building's character defining features; found the range of alternatives to be adequate; acknowledged the challenge of developing a full preservation alternative that met most of the project's basic objectives; expressed a preference for the partial preservation alternative because it preserved what the HPC deemed as the most important element of the historic building– the Mariposa-facing façade of the office wing; and stated that the retention of the east elevation of the shops wing in the full preservation alternative did not improve the project from both a preservation and urban design perspective.

The HPC attributed greater importance to the retention of the office wing on the southeast portion of the site because most of the character-defining features are located along the Mariposa Street façade wrapping around Hampshire Street. Lesser importance was attributed to the character-defining features associated with the shops wing along Hampshire Street. As a result, the HPC requested refinements to the proposed full preservation alternative to focus less on preservation of the Hampshire Street elevation north of the office wing and more on retaining the overall massing of the historic resource as it relates to the massing of the proposed new 75-foot-tall transit facility podium. To make the massing of the new construction more sensitive to the height and massing of the historic resource, the HPC also recommended shifting the massing of the proposed residential component (atop the transit facility podium) from the east portion of site to its west portion in the full preservation alternative. Other requested refinements included further study to improve the ability to meet the additional project objectives related to development of onsite housing.

Thus, the preservation alternatives screening process resulted in changes to the full preservation alternative presented to the HPC, and minor associated refinements to the partial preservation alternative in response to HPC input. The SFMTA and their transit facility design and urban design team (HDR and Sitelab) updated the full and partial preservation alternatives that form the basis for the descriptions for Alternatives B and C discussed and analyzed in detail below.[9] The full preservation alternative that was brought to HPC on October 7, 2020, is also discussed in Section D, Alternatives Considered but Rejected, below.

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[8] San Francisco Historic Preservation Commission, Review and Comment on Preservation Alternatives for Draft EIR, Case No. 2019-021884ENV, 2500 Mariposa Street (Potrero Yard), October 15, 2020.
[9] SFMTA, HDR, and Sitelab, Final Preservation Alternatives Graphics Package, March 10, 2021.

B. DESCRIPTION AND ANALYSIS OF ALTERNATIVES

Based on the alternatives screening process discussed above, the following alternatives were selected for detailed analysis:

- Alternative A: No Project Alternative
- Alternative B: Full Preservation Alternative
- Alternative C: Partial Preservation Alternative
- Alternative D: Transit Facility Plus Commercial Only Alternative

The selected alternatives to the proposed project or project variants are described in detail below and then analyzed in comparison to the impacts of the proposed project or project variants. As noted on p. 5.1, the only feasible variants to the selected alternatives would be the Emergency Exit Relocation Variant, the Active 17th Street Variant, and the Employee and Family Support Variant. For purposes of this alternatives chapter, references to project variants exclude the Joint Development Lobby Relocation Variant because it would not be a feasible variant with any of the project alternatives. The Joint Development Lobby Relocation Variant would not be a feasible variant under the preservation alternatives due to the focus on retaining the office wing (which is already set back 20 feet from the Mariposa Street property line) with no development above and the series of setbacks and notches necessary to visually separate new construction from the retained historical resource. Under each of the preservation alternatives residential development in the transit facility podium would be limited to Bryant Street and the portion of Mariposa Street between the retained office wing and Bryant Street; thus, no residential lobby would be developed between York and Hampshire streets that would need to be relocated. Under Alternative D there would be no residential component; thus, this project variant would not be applicable.

Furthermore, as with the proposed project or project variants, the selected alternatives would incorporate public works' standard construction measures (SCMs) to protect human health and safety as well as environmental resources as stated in **EIR Chapter 2, Project Description**, pp. 2.49-2.54. Public works' SCMs are related to the following environmental resources or related topics: seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (project site), and cultural resources (archeological resources and historic architectural resources). All of public works' SCMs are listed below (see **Table 2.3: San Francisco Public Works Standard Construction Measures**, in **EIR Chapter 2, Project Description**, pp. 2.50-2.53, for a description of these measures). See applicable EIR sections and initial study topics (**EIR Appendix B**) for a discussion of how each is incorporated as part of the proposed project or project variants. (See **EIR Appendix C** for a copy of public works' SCMs and attachments):

- Public Works Standard Construction Measure #1, Seismic and Geotechnical Studies
- Public Works Standard Construction Measure #2, Air Quality
- Public Works Standard Construction Measure #3, Water Quality
- Public Works Standard Construction Measure #4, Traffic
- Public Works Standard Construction Measure #5, Noise
- Public Works Standard Construction Measure #6, Hazardous Materials
- Public Works Standard Construction Measure #7, Biological Resources
- Public Works Standard Construction Measure #8, Visual and Aesthetic Considerations
- Public Works Standard Construction Measure #9, Cultural Resources

SELECTED ALTERNATIVES

As noted above on pp. 5.9-5.12, the two preservation alternatives are the culmination of a screening process that considered various site plans, building retention programs, building heights, views of the character-defining features, and feedback from the HPC. See **Table 5.1: Comparison of Characteristics of the Proposed Project and EIR Alternatives**, pp. 5.18-5.22, for an overview of the main characteristics of the alternatives compared to those of the proposed project or project variants. See **Table 5.2: Comparison of Effects of Proposed Project and EIR Alternatives on Character-Defining Features of the Historical Resource**, pp. 5.23-5.24, for a summary of the retention of the character-defining features of the historical resource under the alternatives compared to the proposed project or project variants. The selected preservation alternatives, as mentioned above, could also lessen the significant and unavoidable air quality impacts as reduced versions of the proposed project or project variants; however, the reduced density alternative (Alternative D) was chosen to specifically address the significant and unavoidable air quality impacts as the development density for this alternative would be further reduced compared to the preservation alternatives.

The selected alternatives to the proposed project or project variants (excluding the Joint Development Lobby Relocation Variant) were determined to adequately represent the range of potentially feasible alternatives required under CEQA. One of the preservation alternatives (Alternative B) and the no project alternative (Alternative A) would avoid or substantially lessen the significant and unavoidable historic architectural resource impact, would avoid or substantially lessen the significant and unavoidable project and cumulative air quality impacts, and would also avoid or substantially lessen one or more other significant impacts that were identified for the proposed project or project variants. The other preservation alternative (Alternative C) would lessen the significant and unavoidable historic architectural resource impact but not to a less-than-significant level, would avoid or substantially lessen the significant and unavoidable project and cumulative air quality impacts, and would also avoid or substantially lessen one or more other significant impacts that were identified for the proposed project or project variants. The transit

facility plus commercial only alternative (Alternative D) would avoid or substantially lessen the significant and unavoidable project and cumulative air quality impacts and would also avoid or substantially lessen one or more significant impacts, e.g., noise and vibration impacts, but would not avoid or substantially lessen the significant and unavoidable historic architectural resource impact. Alternative D also provides decision makers and the public with an understanding of the impacts attributable to development of the replacement transit facility with commercial uses only. Additionally, pursuant to CEQA requirements, all of the alternatives (except Alternative A) would meet most of the project's basic objectives and its additional objectives, with some meeting objectives more than others. For example, Alternative D would meet fewer of the additional project objectives than Alternatives B or C because there would be no residential component to the joint development. See **Table 5.3: Ability of Alternatives to Meet Project Objectives**, pp. 5.25-5.27, for a summary comparison of the ability of each alternative to achieve the basic and additional project objectives.

Descriptions and assumptions for each of the alternatives are presented below on pp. 5.36-5.70, starting with Alternative A. The descriptions of the full and partial preservation alternatives (Alternatives B and C, respectively) follow the same for Alternative A and are based on the preservation alternatives presented in the Final Preservation Alternatives Graphics Package prepared by the SFMTA, HDR, and Sitelab and the Preservation Alternative Memorandum prepared by VerPlanck Historic Preservation Consulting.[10],[11] Site plan and building massing graphics are presented for each alternative except the no project and transit facility plus commercial only alternatives (Alternatives A and D, respectively) which include only site plans.

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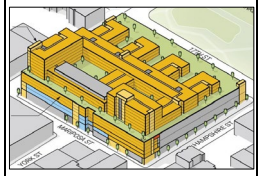
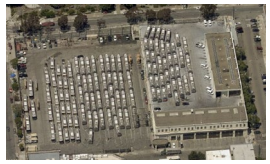
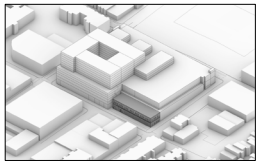
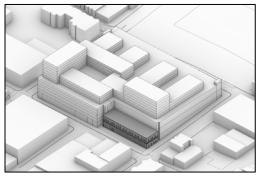
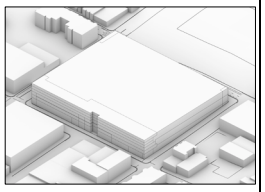
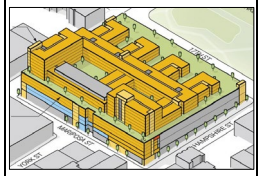
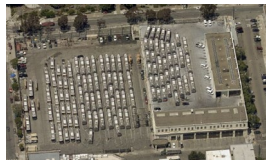
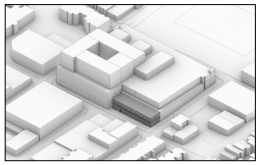
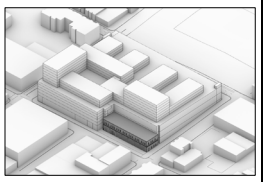
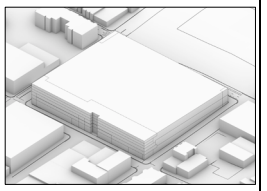
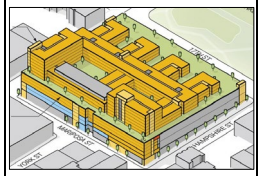
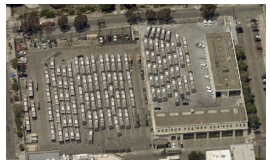
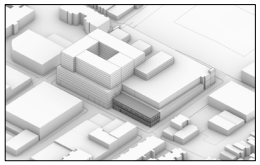
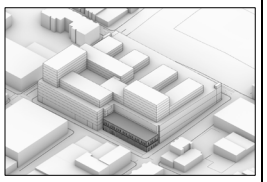
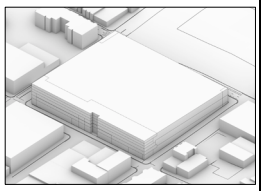
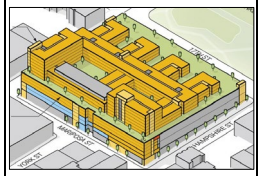
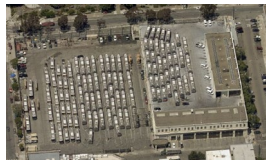
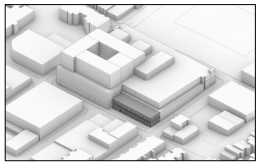
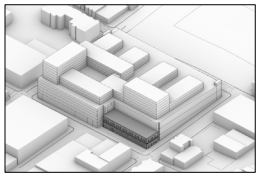
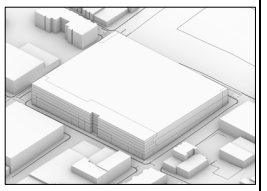
[10] SFMTA, HDR, and Sitelab, Final Preservation Alternatives Graphics Package, March 10, 2021.
[11] VerPlanck Historic Preservation Consulting, Potrero Yard Preservation Alternatives Memorandum, 2500 Mariposa Street, Case No. 2019-021884ENV, September 21, 2020.

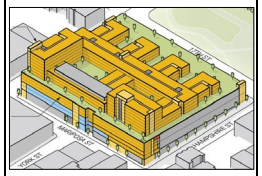
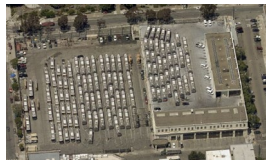
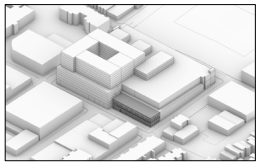
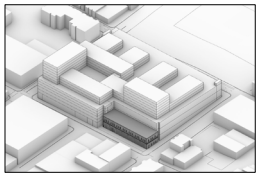
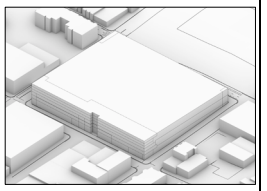
Table 5.1: Comparison of Characteristics of the Proposed Project and EIR Alternatives

	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Characteristics of the Proposed Project and Project Alternatives					
Transit Facility Podium Height (feet)	75	10.5 – 44	75	75	75
Number of Transit Facility Stories	3	2	3	3	3
High-Rise Tower Height (feet)	Up to 150	–	Up to 150	Up to 150	–
Number of Joint Development Stories	Up to 13	–	Up to 13	Up to 13	–
Excavation Depth	35 feet; 248,900 cubic yards	–	35 feet; 248,900 cubic yards	35 feet; 248,900 cubic yards	35 feet; 248,900 cubic yards
Construction Duration	3 – 4 years	–	3 – 4 years	3 – 4 years	2.5 – 3 years
Building and Site Characteristics	**1,300,000 gsf**	**221,450 gsf**	**1,060,000 gsf**	**1,070,000 gsf**	**756,000 gsf**
Paved Bus Storage Yard	–	112,450 gsf	–	–	
Enclosed Bus Facility	723,000 gsf	109,000 gsf	578,000 gsf	597,000 gsf	723,000 gsf
Ramps & Circulation, Bus Storage and Service	*671,000 gsf*	–	*532,000 gsf*	*551,000 gsf*	*671,000 gsf*
Administration and Common Area	*52,000 gsf*	–	*46,000 gsf*	*46,000 gsf*	*52,000 gsf*
Residential	544,000 gsf	–	449,000 gsf	440,000 gsf	–
Commercial	33,000 gsf	–	33,000 gsf	33,000 gsf	33,000 gsf

	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Residential Units	**575**	–	**477**	**459**	–
Studio	141	–	114	110	–
One-Bedroom	206	–	172	165	–
Two- to Three-Bedroom	228	–	191	184	–
Open Space	**91,000 sq. ft.**		**81,000 sq. ft.**	**84,000 sq. ft.**	**91,000 sq. ft.**
Transportation and Circulation Features of the Proposed Project and Project Alternatives					
Maintenances Repair Bays	**18**	**24**	**16**	**16**	**18**
Vehicle Parking Spaces [NOTE C]	**310**	**214**	**270**	**283**	**310**
Trolley Coaches (40 foot/60 foot)	213 (63/150)	158 (65/93)	194 (74/120)	207 (43/164)	213 (63/150)
Non-Revenue Vehicles (large/standard)	97 (8/89)	56	76 (3/73)	76 (3/73)	97 (8/89)
SFMTA Staff	0	0	0	0	0
Residential	0	–	0	0	–
Loading Supply	**160 curb feet (3/2)**	**0 curb feet (0/1)**	**100 curb feet (2/2)**	**100 curb feet (2/2)**	**40 curb feet (1/2)**
Commercial (On-Street/Off-Street)	40 curb feet (1/2)	0 curb feet (0/1)	40 curb feet (1/2)	40 curb feet (1/2)	40 curb feet (1/2)
Passenger (On-Street/Off-Street)	120 curb feet (2/0)	None	60 curb feet (1/0)	60 curb feet (1/0)	–
On-Street Parking Spaces Removed Along Adjacent Streets	**48**	–	**24**	**24**	**19**

	Proposed Project [NOTE A]	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative** [NOTE B]	**Alternative C: Partial Preservation Alternative** [NOTE B]	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Bicycle Parking Spaces	**773**	**5**	**295**	**291**	**69**
Class 1	736 [NOTE D]	0	252	249	60
Class 2	37	5	43	42	9
Streetscape Changes					
Curb Cuts [NOTE E]					
17th Street between Bryant and Hampshire streets	1 (42 feet)	1 (52 feet)	1 (42 feet)	1 (42 feet)	1 (42 feet)
Mariposa Street between Bryant and Hampshire streets	4 (20 feet, 97 feet, 63 feet, 47 feet)	4 (30 feet, 50 feet, 13 feet, 146 feet)	3 (20 feet, 97 feet, 222 feet)	3 (20 feet, 97 feet, 222 feet)	4 (20 feet, 97 feet, 63 feet, 47 feet)
Sidewalk Extensions					
Bryant Street north of Mariposa Street	Yes	No	Yes	Yes	Yes
Mariposa Street east of Bryant Street	Yes	No	Yes	Yes	Yes
Hampshire Street north of Mariposa Street	Yes	No	No	No	Yes
Sidewalk Improvements					
Mariposa Street widening	12-foot width	7-foot width	12-foot width	12-foot width	12-foot width
Street tree retention and replacement	Yes	No	Yes	Yes	Yes

	Proposed Project [NOTE A]	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative** [NOTE B]	**Alternative C: Partial Preservation Alternative** [NOTE B]	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Intersection Improvements					
Raided crosswalk with rapid flash beacon at crossing of 17th Street at Hampshire Street	Yes	No	Yes	Yes	Yes
Curb ramps for pedestrian crossings adjacent to the project site and a curb ramp on the southeastern side of the Mariposa/York street intersection facing Mariposa Street	Yes	No	Yes	Yes	Yes
Continental-style crosswalks at all approaches at the intersections of Hampshire/17th streets, Hampshire/Mariposa streets, Mariposa/York streets	Yes	No	Yes	Yes	Yes
Bicycle Lanes					
17th Street between Bryant and Hampshire streets	Protected, widened, painted green	No	Protected, widened, painted green	Protected, widened, painted green	Protected, widened, painted green
Bus Stops					
Northwest and southeast corners of Mariposa and Bryant streets	New shelters, transit notification systems, and lighting	No	New shelters, transit notification systems, and lighting	New shelters, transit notification systems, and lighting	New shelters, transit notification systems, and lighting

	Proposed Project [NOTE A]	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative [NOTE B]	Alternative C: Partial Preservation Alternative [NOTE B]	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Transportation Demand Management Measures [NOTE F]	Yes	–	Yes	Yes	Yes
Sustainability Features					
LEED Certification Goal	LEED Gold	–	LEED Gold	LEED Gold	LEED Gold
Utility Infrastructure					
Connect to existing water, AWSS, sewer, and electrical infrastructure systems (Bryant, 17th, Hampshire and Mariposa streets)	Yes	–	Yes	Yes	Yes

Notes: gsf – gross square feet; LEED – Leadership in Energy and Environmental Design

[A] Original proposed project drawings are conceptual and indicate 576,000 gsf of space for bus ramps and circulation and bus storage and service on all three transit levels, and 4,000 gsf of ground-floor commercial space along Bryant Street. For purposes of a reasonable worst-case CEQA analysis and to maintain flexibility in the design process to accommodate sustainability and urban design goals, a 95,000-gsf buffer for bus ramps and bus circulation and bus storage and service areas was added to increase the overall transit facility gsf. Also, 33,000 gsf of commercial space was assumed (with no reduction to transit facility gsf). Like the proposed project, the historic preservation alternatives assume 33,000 gsf of commercial space; however, for purposes of determining constraints to efficient bus circulation and fleet service needs, comparisons were made to the conceptual proposed project drawings demonstrating 4,000 gsf of commercial space.

[B] See Final Preservation Alternatives Graphics Package (March 10, 2021) for specific program assumptions.

[C] Twelve car-share spaces would be provided under the proposed project or project variants; four would be provided under Alternatives B and C based on planning code requirements for residential uses. None would be required for non-residential uses because parking would not be provided. Alternative D would not be required to include any car-share spaces. (See planning code section 166 requirements.)

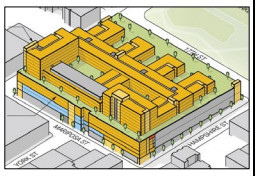
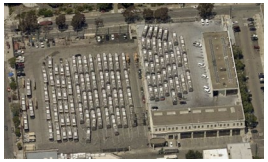
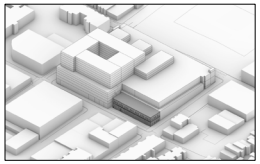
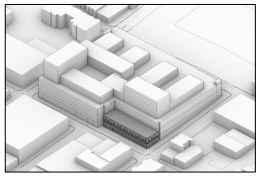
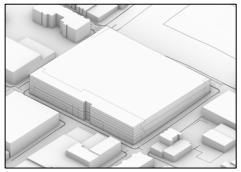
[D] Class 1 bicycle spaces meet or exceed planning code section 155 requirements.

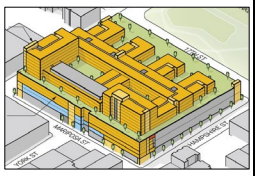
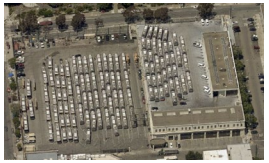
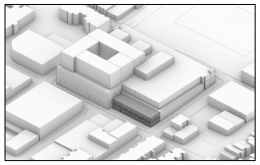
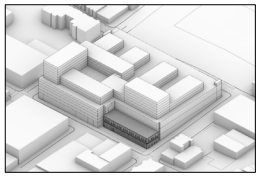
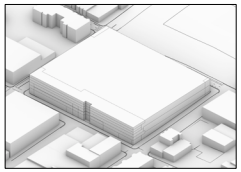
[E] There are no existing curb cuts, and none are proposed, along Bryant Street between Mariposa and 17th streets and Hampshire Street between Mariposa and 17th streets.

[F] The TDM Program (under development) is implemented citywide across all SFMTA facilities, including the Potrero Yard site, and available/applicable to all SFMTA staff.

Source: SFMTA, Sitelab, and HDR, July 2020 and March 2021

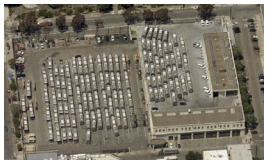
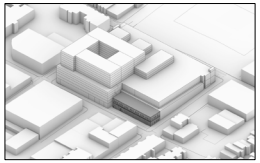
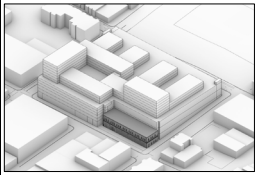
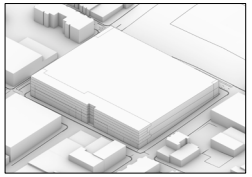
Table 5.2: Comparison of Effects of Proposed Project and EIR Alternatives on Character-Defining Features of Historical Resource

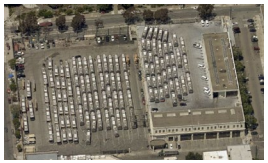
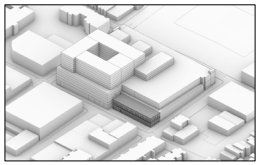
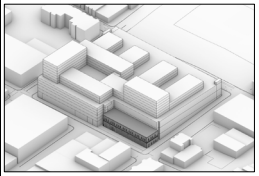
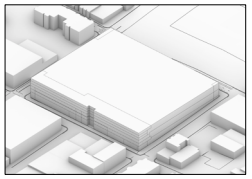
	Proposed Project	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative**	**Alternative C: Partial Preservation Alternative**	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Character Defining Features					
Overall height and massing of the two-story office wing including its flat roof	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Overall height and massing of the remaining portions of the original shops wing along Hampshire Street, including its flat roof	Demolished	*Retained*	Partially Retained	Demolished	Demolished
Fenestration pattern on office wing (Mariposa and Hampshire streets only) consisting of large vehicular openings at the first floor and groups of three double-hung metal windows at the second-floor level	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire streets, including:	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Re-entrant corner detailing	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Pilaster separating the vehicular openings and door hoods	Demolished	*Retained*	*Retained*	*Retained*	Demolished

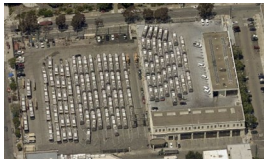
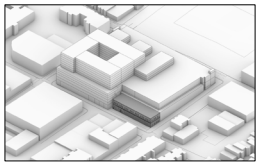
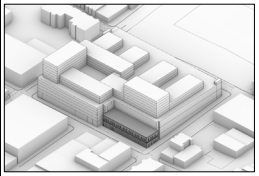
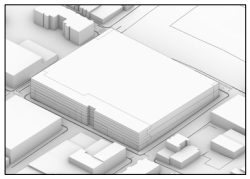
	Proposed Project 	**Alternative A: No Project Alternative** 	**Alternative B: Full Preservation Alternative** 	**Alternative C: Partial Preservation Alternative** 	**Alternative D: Transit Facility Plus Commercial Only Alternative** 
Molded intermediate cornice	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Continuous lug sill beneath the windows,	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Shallow cornice, and	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Medallion featuring original Muni logo	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street	Demolished	*Retained*	Partially Retained	Partially Retained	Demolished
Remaining pedestrian door surround on Hampshire Street façade with inscription above	Demolished	Retained	*Retained*	*Retained*	Demolished
Remaining door trim on westernmost vehicular bay on Mariposa Street	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Surviving double-hung, six-over-six, metal windows on office wing	Demolished	*Retained*	*Retained*	*Retained*	Demolished
Flagpole	Demolished	*Retained*	*Retained*	*Retained*	Demolished

Source: San Francisco Planning Department, Historic Resource Evaluation, Part 1, September 25, 2020 (see **EIR Appendix D-2**).

Table 5.3: Ability of Alternatives to Meet Project Objectives

Project Objectives	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
				
Would the alternative meet this objective?				
Basic Objectives				
1. Rebuild, expand, and modernize the SFMTA's Potrero Bus Yard by 2026 to efficiently maintain and store a growing Muni bus fleet according to the SFMTA Fleet Plan and Facilities Framework schedule.	No	Partially	Partially	Yes
2. Construct the first SFMTA transit facility with infrastructure for battery electric buses to facilitate Muni's transition to an all-electric fleet, in accordance with San Francisco and California policy.	No	Partially	Partially	Yes
3. Construct a new public asset that is resilient to earthquakes and projected climate change effects, and provides a safe, secure environment for the SFMTA's employees and assets.	No	Yes	Yes	Yes
4. Improve working conditions for the SFMTA's workforce of transit operators, mechanics, and front-line administrative staff through a new facility at Potrero Yard.	No	Yes	Yes	Yes

Project Objectives	Alternative A: No Project Alternative 	Alternative B: Full Preservation Alternative 	Alternative C: Partial Preservation Alternative 	Alternative D: Transit Facility Plus Commercial Only Alternative 
Would the alternative meet this objective?				
5. Achieve systemwide master plan priorities by consolidating two currently scattered transit support functions at Potrero Yard: o Improve and streamline transit operator hiring by consolidating the SFMTA's operator training function in a new, state-of-the-art facility. o Support efficient Muni operations by consolidating the Street Operations division in a modern, convenient facility.	No	Partially	Partially	Yes
6. Implement inclusive and transparent stakeholder engagement in designing this project and completing the CEQA process.	No	Yes	Yes	Yes
7. Create a development that is financially feasible, meaning that the public asset can be funded by public means and public transportation funds are used only for the bus yard component.	No	Yes	Yes	Yes
Additional Objectives				
8. Enhance safety and reduce conflicts between transit, commercial vehicles, bicyclists, drivers, and pedestrians in the project site vicinity.	No	Yes	Yes	Yes
9. Improve the architectural and urban design character of the project site by replacing the existing fences and blank walls with more active, transparent street walls, to the extent feasible.	No	Yes	Yes	Yes

Project Objectives	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
				
Would the alternative meet this objective?				
10. Maximize the reuse of this 4.4-acre site in a central, mixed-use neighborhood by creating a mixed-use development and providing dense housing and striving to maximize the number of affordable units on the site.	No	Partially	Partially	No
11. Increase the City's supply of housing by contributing to the Mayor's Public Lands for Housing goals, the San Francisco General Plan Housing Element goals, and the Association of Bay Area Governments' Regional Housing Needs Allocation for San Francisco by optimizing the number of dwelling units, including affordable housing, particularly near transit.	No	Partially	Partially	No
12. Support transit-oriented development and promote the use of public transportation through an innovative and comprehensive transportation demand management program.	Yes	Yes	Yes	Yes
13. Ensure that joint development is able to fund its own construction and ongoing management without reliance on City subsidy other than what is originally assumed as part of the project budget while ensuring that SFMTA's transportation funds are only allocated for the transit use.	No	Yes	Yes	N/A
14. Demonstrate the City's leadership in sustainable development by constructing an environmentally low-impact facility intended to increase the site's resource efficiency.	No	Yes	Yes	Yes

Source: SFMTA, 2021

FRAMEWORK FOR ANALYSIS OF THE ALTERNATIVES

The alternatives impact analysis that follows each of the descriptions of the alternatives is generally qualitative and is based on the same environmental setting, significance thresholds, and approach to analysis as presented for the proposed project or project variants in **EIR Chapter 3** relative to the identified impacts of the proposed project or project variants for Historic Architectural Resources, Transportation and Circulation, Noise and Vibration, Air Quality, Wind, and Shadow and for topics covered in the initial study (**EIR Appendix B**).

As discussed on p. 3.B.27 in **EIR Section 3.B, Historic Architectural Resources**, CEQA Guidelines section 15064.5(b) establishes the criteria for assessing a significant environmental impact on historical resources. It states, "[a] project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." The section defines "substantial adverse change in the significance of an historical resource" as a "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (section 15064.5(b)(1)). The significance of an historic architectural resource is considered to be "materially impaired" when a project demolishes or materially alters the physical characteristics that justify inclusion of the resource in the California Register of Historic Resources, or that justify inclusion of the resource in a local register, or that justify its eligibility for inclusion in the California Register of Historic Resources as determined by the lead agency for the purposes of CEQA (section 15064.5(b)(2)).

Table 5.4: Comparison of Significant Impacts of the Proposed Project and EIR Alternatives, pp. 5.29-5.35, provides a comparison of the significant impacts of the proposed project or project variants to those of the alternatives, as well as the comparative effects among the alternatives. This table identifies whether the significant impacts anticipated under any of the four alternatives would be similar to, greater than, or less than the significant impacts that would occur with construction and operation of the proposed project or project variants (excluding the Joint Development Lobby Relocation Variant).

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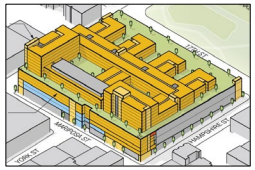
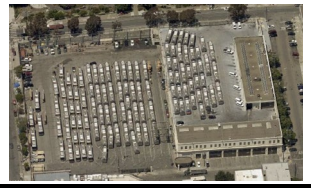
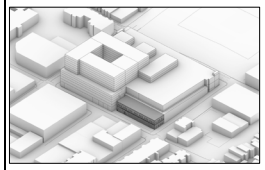
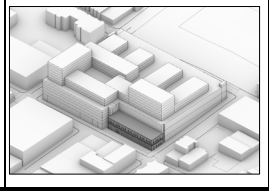
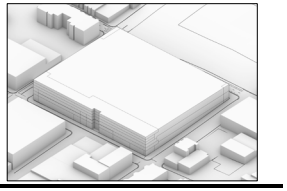
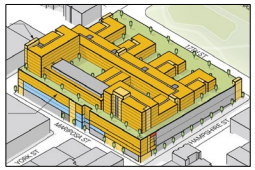
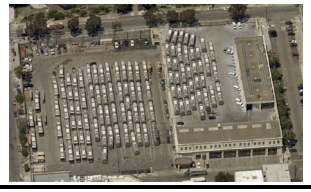
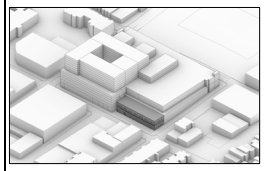
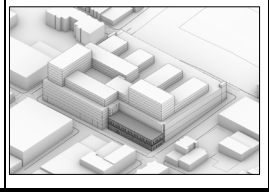
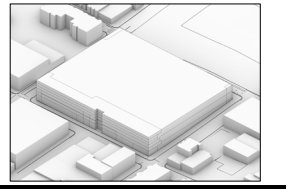
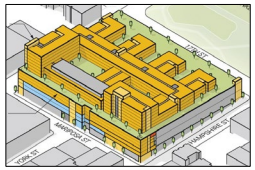
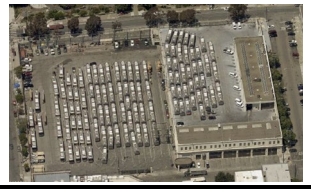
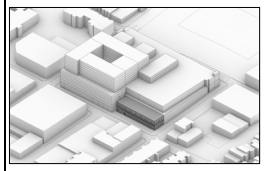
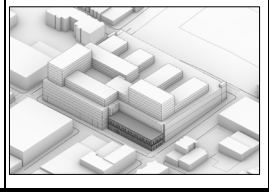
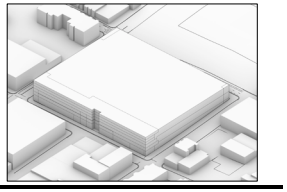
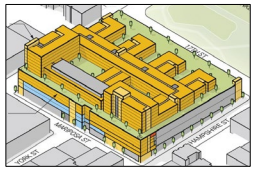
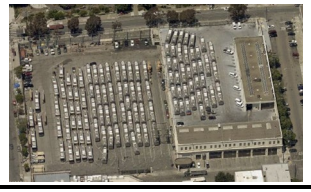
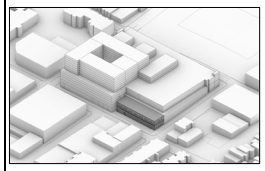
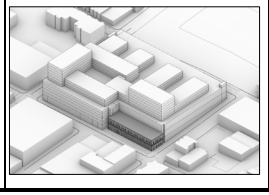
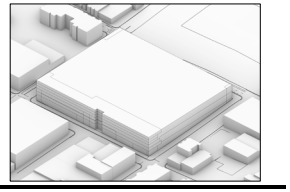
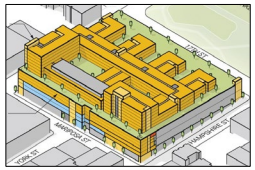
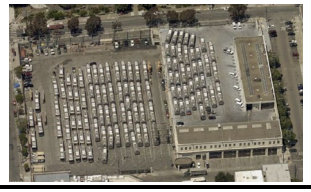
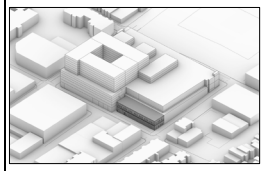
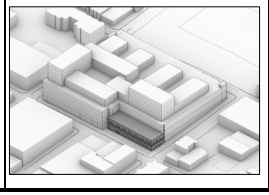
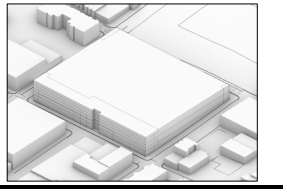
Table 5.4: Comparison of Significant Impacts of the Proposed Project and EIR Alternatives

	Proposed Project	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative**	**Alternative C: Partial Preservation Alternative**	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Cultural Resources Impacts (EIR Section 3.B)					
Onsite Historical Architectural Resource					
CR-1: The proposed project or project variants would cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5 of the CEQA Guidelines.	SUM	No Impact (NI)	Less than the proposed project or project variants (LTS)	Similar to but reduced from those of the proposed project or project variants (SUM)	Similar to the proposed project or project variants (SUM)
Tribal Cultural Resources (Initial Study Topic E.5)					
Change in Significance					
TCR-1: Construction of the proposed project or project variants could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

	Proposed Project	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative**	**Alternative C: Partial Preservation Alternative**	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Cumulative Tribal Cultural Resources					
C-TCR-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative tribal cultural resources impacts.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Noise and Vibration Impacts (EIR Section 3.D)					
Construction Noise					
NO-1: Construction of the proposed project or project variants would generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the San Francisco Noise Ordinance or applicable standards of other agencies.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

	Proposed Project	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative**	**Alternative C: Partial Preservation Alternative**	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Construction Vibration					
NO-2: Construction of the proposed project or project variants would generate excessive groundborne vibration or groundborne noise levels.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Operational Noise					
NO-3: Operation of the proposed project or project variants would generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan, or applicable standards of other agencies.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Cumulative Construction Noise					
C-NO-1: Construction noise as a result of the proposed project or project variants, combined with	LTSM	No Impact (NI)	Similar to the proposed project or	Similar to the proposed project or	Similar to the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
construction noise from cumulative projects in the vicinity, would cause a substantial temporary increase in ambient noise levels.			project variants (LTSM)	project variants (LTSM)	
Air Quality Impacts (EIR Section 3.E)					
Fugitive Dust and Criteria Air Pollutants (Construction)					
AQ-1: During construction, the proposed project or project variants would not generate significant fugitive dust emissions, but would generate criteria air pollutant emissions at levels which would result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.	LTSM	No Impact (NI)	Similar to but less than the proposed project or project variants (LTSM)	Similar to but less than the proposed project or project variants (LTSM)	Less than the proposed project or project variants (LTSM)

	Proposed Project	**Alternative A: No Project Alternative**	**Alternative B: Full Preservation Alternative**	**Alternative C: Partial Preservation Alternative**	**Alternative D: Transit Facility Plus Commercial Only Alternative**
					
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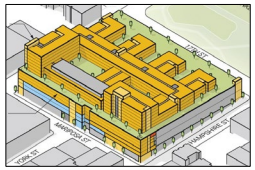
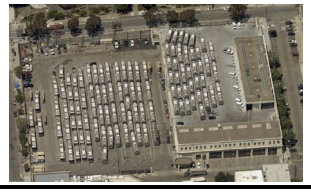
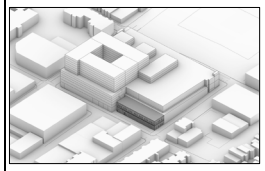
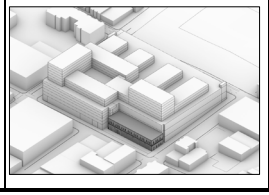
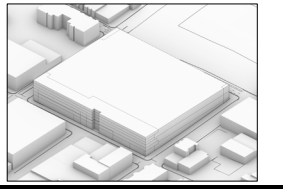
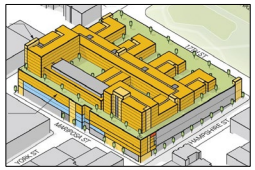
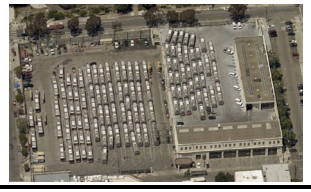
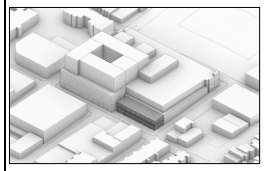
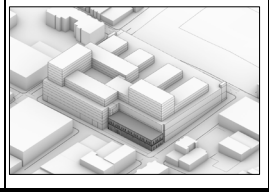
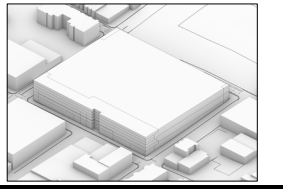
Toxic Air Contaminants (Construction and Operation)					
AQ-3: Construction and operation of the proposed project or project variants would generate toxic air contaminants, including DPM, at levels which would expose sensitive receptors to substantial pollutant concentrations.	SUM	No Impact (NI)	Similar to but less than the proposed project or project variants (LTSM)	Similar to but less than the proposed project or project variants (LTSM)	Less than the proposed project or project variants (LTSM)
Cumulative Air Quality					
C-AQ-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would contribute considerably to cumulative health risk impacts on sensitive receptors.	SUM	No Impact (NI)	Similar to but less than the proposed project or project variants (LTSM)	Similar to but less than the proposed project or project variants (LTSM)	Less than the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
Legend: NI = No impact; LTS = Less than significant or negligible impact, no mitigation required; LTSM = Significant but mitigable to less than significant impact; SU = Significant and unavoidable adverse impact, no feasible mitigation; SUM = Significant and unavoidable impact after mitigation; N/A = Not Applicable					
Wind Impacts (EIR Section 3.F)					
Wind in Outdoor Public Areas					
WI-1: The proposed project or project variants would create wind hazards in publicly accessible areas of substantial pedestrian use in the vicinity of the project site.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)
Cumulative Wind					
C-WI-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would alter wind in a manner that would make a cumulatively considerable contribution to a significant cumulative wind impact.	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

	Proposed Project	Alternative A: No Project Alternative	Alternative B: Full Preservation Alternative	Alternative C: Partial Preservation Alternative	Alternative D: Transit Facility Plus Commercial Only Alternative
					
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Geology and Soils Impacts (Initial Study Topic E.16)					
Paleontological Resources					
GE-6: The proposed project or project variants could directly or indirectly destroy a unique paleontological resource or site**.**	LTSM	No Impact (NI)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)	Similar to the proposed project or project variants (LTSM)

ALTERNATIVE A: NO PROJECT ALTERNATIVE

DESCRIPTION

As discussed above, CEQA requires the evaluation of a "no project" alternative among the range of alternatives analyzed. Under Alternative A, existing land use controls on the project site would continue to govern site development and the existing site would continue to function as a transit facility, which would not constitute a change from existing conditions. (See **Figure 5.2: Alternative A: No Project Alternative – Existing Site Plan**.)

Under Alternative A, the existing maintenance and operations building would be retained in its current configuration, including its flat roof (parking deck) and second-story additions constructed in 1924 along Mariposa and Hampshire streets for offices and maintenance shops, respectively. The overall height and massing (approximately 45-foot height at Mariposa and Hampshire streets) would be preserved. The paved bus storage yard on the western portion of the site with access from Mariposa Street would also be retained in its current condition.

Under Alternative A, the SFMTA would continue to store and service its off-duty buses on the storage yard and parking deck accessed from Mariposa and 17th streets, respectively; and would continue to operate the project site as one of the SFMTA's six transit fleet storage and maintenance facilities. Buses would continue to circulate around the site on the adjacent streets. All bus washing and other service functions, such as fare recovery and light maintenance, would occur on the storage yard accessed from Mariposa Street, with other light duty and heavy repair activities occurring within the maintenance bays. No new residential or commercial uses would be added. Under Alternative A, transit fleet expansion projections in the SFMTA's transit fleet plan would be accommodated at the SFMTA's future Muni Metro East temporary swing facility; and at existing SFMTA storage and maintenance facilities such as the Presidio, Kirkland, and Woods yards for the 40-foot-long buses, and the Flynn and Islais Creek divisions and 1399 Marin Street Facility for the 60-foot-long buses). It is not likely that planned transit fleet expansion in accordance with the SFMTA's transit fleet plan would be accommodated on an entirely new site because the City does not have control, through ownership or lease, of other sites large enough to accommodate the proposed transit fleet expansion (see Section D, Alternatives Considered but Rejected, below).

Therefore, the existing physical features on the project site, including the character-defining features of the historical resource, would not change and no modifications, repairs, or restoration would be made to the existing historical resource.

Source: SFMTA; SITELAB urban studio; HDR, March 2021

POTRERO YARD MODERNIZATION PROJECT

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FIGURE 5.2: ALTERNATIVE A: NO PROJECT ALTERNATIVE – EXISTING SITE PLAN

IMPACTS OF ALTERNATIVE A: NO PROJECT ALTERNATIVE

The analysis of the no project alternative assumes that the proposed project or project variants would not be approved and would result in a "no build" alternative wherein the existing environmental setting is maintained. Thus, this environmental analysis assumes that the existing structure and uses on the project site would not change and that the existing physical conditions described in **EIR Chapter 3, Environmental Setting and Impacts**, and in **Section E, Evaluation of Environmental Effects**, in the initial study (see **EIR Appendix B**) would remain the same.

If Alternative A were to proceed, no changes would be implemented, and none of the impacts associated with the proposed project or project variants, as described in **EIR Chapter 3** and the initial study, would occur. However, incremental changes would be expected to occur in the vicinity of the project site as nearby cumulative projects (see pp. 3.A.6-3.A.9) are approved, constructed, and occupied. With no change to existing site conditions under the no project alternative, land use activity on the project site would not contribute to significant cumulative impacts beyond existing levels.

Cultural Resources (Historic Architectural Resources)

Since the no project alternative would retain all the character-defining features of the subject property and not demolish or make any modifications or repairs to the historical resource, it would not cause material impairment. Compared to the proposed project or project variants, which would demolish the building resulting in material impairment to the historical resource and a significant and unavoidable impact even with mitigation, Alternative A would not result in any project-level impacts and would not contribute to any cumulative impacts related to historic architectural resources.

Air Quality

Since the no project alternative would retain the existing maintenance and operations building and the paved bus storage yard it would not include any construction activities. Compared to the proposed project or project variants, which would result in significant and unavoidable construction-related project and cumulative air quality impacts even with mitigation, Alternative A would not result in any project-level impacts and would not contribute to any cumulative impacts associated with exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk.

Other Topics Covered in the EIR and Initial Study

Under Alternative A, the project site would remain in its existing condition, with no new construction. Because no construction would occur under Alternative A and Potrero Yard would continue to operate in its current condition, it would not have any impacts on any of the other topics analyzed in the EIR or initial study (**EIR Appendix B**), including those identified as less than significant with mitigation or significant and unavoidable with mitigation as shown in **Table 5.4**, pp. 5.29-5.35.

Impacts under Alternative A related to land use and planning, population and housing, archaeological resources and human remains, tribal cultural resources, transportation and circulation, noise and vibration, air quality, greenhouse gas emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, energy, mineral resources, agricultural and forestry resources, and wildfire would be less than those anticipated with implementation of the proposed project or project variants because no construction, ground-disturbing activities, or changes to operations would occur. Because all of these impacts would be avoided, none of the mitigation or improvement measures identified for the proposed project or project variants would be required under Alternative A.

ALTERNATIVE B: FULL PRESERVATION ALTERNATIVE

DESCRIPTION

Under Alternative B, the existing, approximately 45-foot-tall, office wing along Mariposa Street would be retained and the remainder of the maintenance and operations building would be demolished, including the shops wing along Hampshire Street north of the office wing. The replacement transit facility would cover the remainder of the site, including the bus yard on the west portion of the site. See **Figure 5.3: Alternative B: Full Preservation Alternative – Site Plan** and **Figure 5.4: Alternative B: Full Preservation Alternative – Massing Views**).

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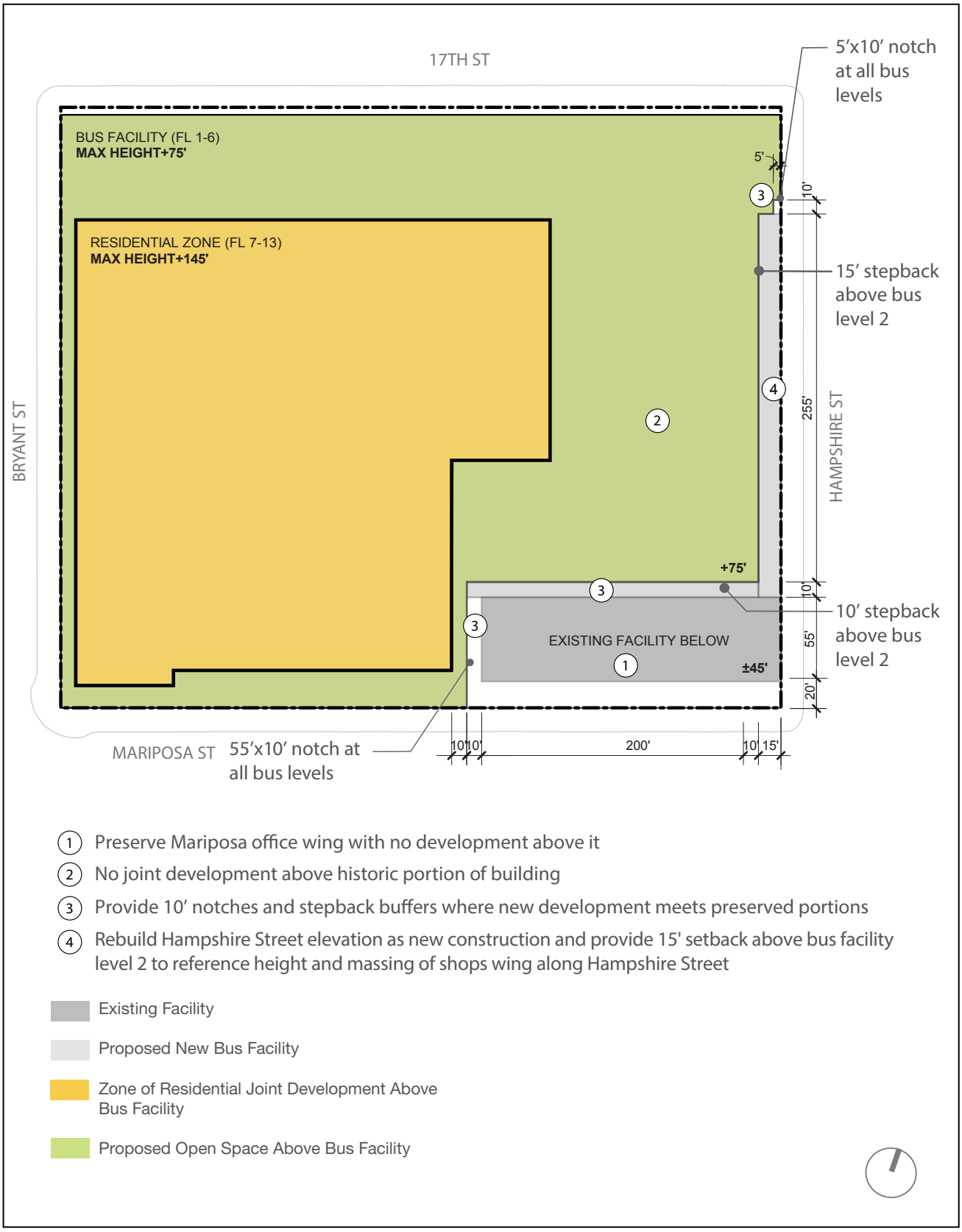

Source: SFMTA; SITELAB urban studio; HDR, March 2021

POTRERO YARD MODERNIZATION PROJECT

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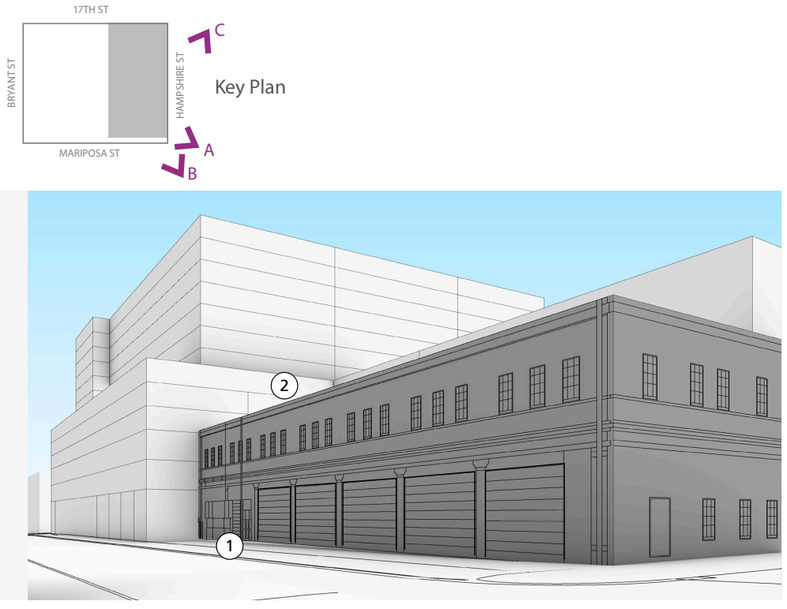
FIGURE 5.3: ALTERNATIVE B: FULL PRESERVATION ALTERNATIVE – SITE PLAN

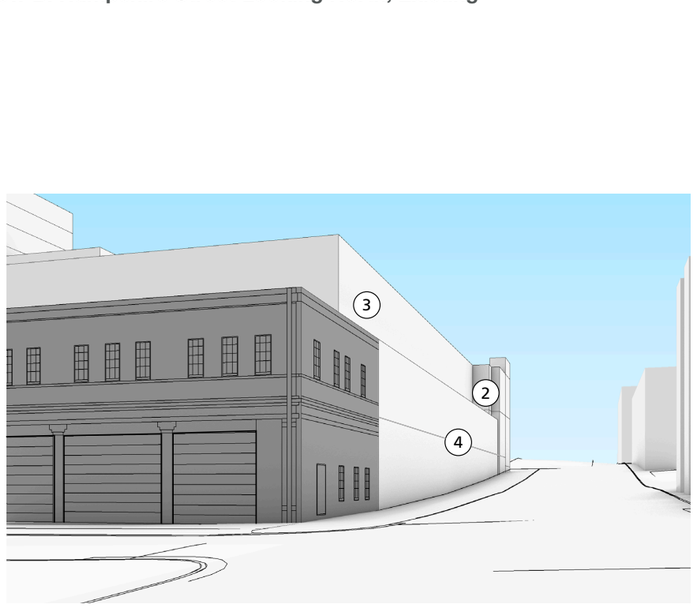
View A: Mariposa Street Looking Northwest, Existing

View B: Hampshire Street Looking North, Existing

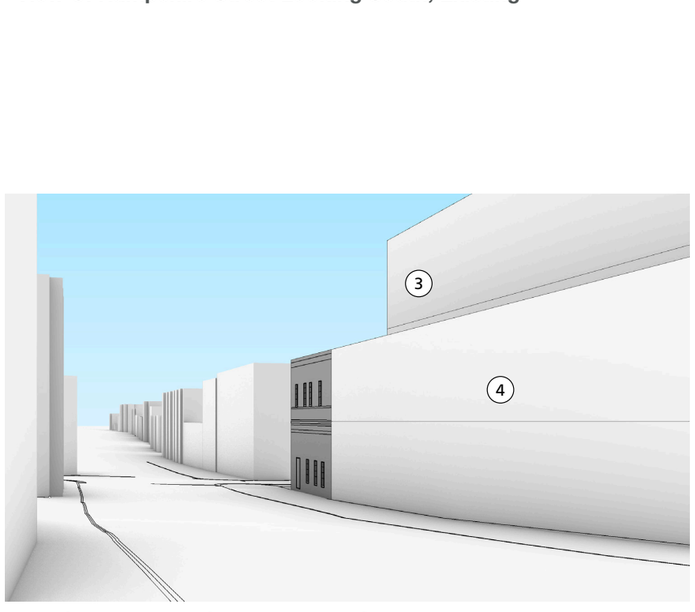
View C: Hampshire Street Looking South, Existing



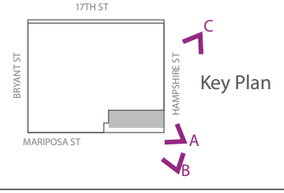
View A: Mariposa Street Looking Northwest, Proposed



View B: Hampshire Street Looking North, Proposed



View C: Hampshire Street Looking South, Proposed



KEYNOTES

1. Additional openings required for bus exit at maintenance bays
2. Provide 10′ notches and stepback buffers where new development meets retained office wing
3. 15′ stepback above bus level 2
4. Rebuild Hampshire Street elevation as new construction

Retained Historical Resource

New Construction

Source: SFMTA; SITELAB urban studio; HDR, March 2021

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FIGURE 5.4: ALTERNATIVE B: FULL PRESERVATION ALTERNATIVE – MASSING VIEWS

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As shown in **Figures 5.3 and 5.4**, similar to the proposed project or project variants, the building's three transit levels would rise to a height of 75 feet, with multi-family residential floors above rising to 150 feet (inclusive of the 75-foot-tall transit facility podium). The office wing would be retained and preserved in its entirety with no new construction built on top of it. The shops wing along Hampshire Street would be demolished; however, new construction would feature setbacks that reference the wing's original form and massing. As under the proposed project or project variants, residential uses under this alternative within the new transit facility would be developed along Mariposa and Bryant streets, and on floors above the new transit facility podium. However, the footprint for residential development would be limited under Alternative B due to the retention of the office wing, the transit facility podium setbacks from the retained office wing, and the residential floor setbacks from the transit facility podium. Ground-floor commercial uses would be developed along Bryant Street as under the proposed project or project variants. Most of the character-defining features of the historical resource would be retained and reused (see **Figure 5.3**, p. 5.40). A portion of the existing structure would be retained; however, its spatial relationships with the site and environment would be somewhat altered.

Land Use Program

Alternative B would have a total of approximately 1,060,000 gross square feet of new and rehabilitated space, as follows:

- 532,000 gross square feet of space for bus storage and maintenance, ramps and circulation, and electric bus battery infrastructure
- 46,000 gross square feet of space for SFMTA administration and common areas
- 449,000 gross square feet of residential space with 477 residential units (114 studio, 172 one bedroom, and 191 two-plus bedroom)
- 33,000 gross square feet of ground-floor commercial space
- 81,000 square feet of open space

Site Redevelopment

Under Alternative B, the office wing would be retained in its entirety and restored. The remainder of the maintenance and operations building, including the shops wing, the Hampshire Street wall, and the second-floor parking deck, would be demolished, along with the entry control booths for the paved bus storage yard (at 17th and Hampshire streets and south of the westernmost bay of the office wing). Some façade modifications to the office wing would likely be needed to accommodate the functional needs of the new transit facility. The westernmost bays would need to be modified to accommodate optimal bus turn movements within the new facility before they could be reused as bus exit bays. However, no vertical additions would be built above the retained office wing.

The building's three transit levels (including a mezzanine level) would rise to a height of 75 feet. The new transit facility would be set back from the retained and rehabilitated office wing.

The proposed transit levels along Mariposa Street between Bryant and York streets would be built to the Mariposa Street property line and have a 10-foot-by-55-foot notch to reveal the office wing's west façade. The first transit level, the mezzanine level, and the second transit level would connect to the rear of the retained office wing, while the third transit level would be set back 10 feet from the rear of the office wing.

The proposed transit levels would be built to the property line along Hampshire Street between 17th Street and the retained office wing . However, to demarcate the form and massing of the demolished shops wing, each transit level would feature a 5-foot-by-10-foot notch at its north end at edge of the retained office wing. In addition, the third transit level would be set back 15 feet from Hampshire Street. These features would convey the former massing of the demolished shops wing along Hampshire Street.

The multi-family residential floors atop the transit facility would be oriented differently under Alternative B than under the proposed project or project variants so as to reduce the height and massing of the new building in locations where new construction meets the retained historic resource and to reflect the historic height and massing of the original building. The majority of the residential floors would be developed on the southwest portion of the site along Bryant and Mariposa Streets. Along Mariposa Street immediately west and above the retained office wing, the multi-family residential floors would be set back 10 feet from the transit facility podium such that the overall setback of the larger volume from the west edge of the retained office wing would be 20 feet. The multi-family residential floors would also be set back from the transit facility podium such that the overall massing of the new structure would convey the form and massing of the historical resource. The amount of developable floor area would be substantially reduced in relation to the site's property boundaries(i.e., no development above the retained office wing and residential development limited to the west side of the site as noted in **Figure 5.3**., p. 5.40.)

Site Improvements, Access and Circulation

Streetscape Changes

As with the proposed project or project variants, Alternative B would implement all the proposed streetscape changes with slight variations to the development of sidewalk extensions (i.e., 60-foot-long sidewalk extension and accessible loading zone on Hampshire Street north of Mariposa Street), the location of curb cuts on Mariposa Street, and the tree planting program along Mariposa Street. See **Table 5.1**, pp. 5.18-5.22, for a summary of the streetscape improvements under Alternative B compared to those under the proposed project or project variants.

Vehicle Circulation

Under Alternative B, the vehicle (including bus) circulation system would be similar to that under the proposed project or project variants in that most buses would enter along Mariposa Street near Hampshire Street using the existing and rehabilitated entry bays and exit near York Street and between York and Bryant streets. The major difference that Alternative B would create compared to existing conditions is that the office wing would require two new exit bays at its west end near York Street, and an extension to the curb cut along Mariposa Street to allow this new movement as well as removal of the curb cut for the current entry driveway to the bus storage yard, west of the entry control booth.

Pedestrian Circulation

Under Alternative B, pedestrian circulation for SFMTA staff and the future residents and visitors would be similar to that under the proposed project or project variants. However, with the retention of the office wing at the southeast corner of the site, a portion of the residential component of the joint development uses would not be developed, including a joint development lobby on Mariposa Street between York and Hampshire streets. Thus, pedestrian access for future residents and visitors would be different depending on the site programming for the future residential uses.

Freight and Passenger Loading Program

Under Alternative B, the freight and passenger loading program would be similar to the proposed project or project variants, i.e., off-street loading in the proposed basement level, commercial freight and accessible passenger loading zones along Bryant Street, north of Mariposa Street (see **Table 5.1**, p. 5.18). However, the accessible passenger loading zone along Hampshire Street, north of Mariposa Street, would not be implemented. Under Alternative B, primary access to ground-floor residential lobby spaces would be limited to the southwest corner of the site near Bryant and Mariposa streets, with secondary access at the northwest corner of the site.

Construction

Alternative B would require the same amount of excavation as the proposed project or project variants for the foundation and structural work and the below-grade parking garage. However, due to the retention and rehabilitation of the historic resource, Alternative B would generate less demolition debris. As with the proposed project or project variants, Alternative B would be constructed over three to four years. All public works' SCMs that would be incorporated as part of the proposed project or project variants would also be incorporated as part of Alternative B (see p. 5.15 and **Table 2.3** in **EIR Chapter 2, Project Description**, pp. 2.50–2.53). Due to the proposed modifications to the historic resource and its retention and reuse as part of a new transit facility (including those required for seismic considerations) and the direct adjacency of construction activities, the stricter requirements of public works' **SCM #9, Cultural Resources**, related to

vibration would be incorporated as part of Alternative B unlike the proposed project or project variants and Alternative D. This would require the incorporation of vibration control procedures into all construction contracts. Among the requirements would be the development of a Vibration Control Plan that delineates a vibration-monitoring program to protect such properties from excess vibration during demolition and construction activities associated with the project.

ABILITY TO MEET PROJECT OBJECTIVES

Alternative B would have approximately 240,000 fewer gross square feet of space compared to the proposed project or project variants, which would be 1,300,000 gross square feet. The replacement transit facility would be reduced in size by 145,000 gross square feet—from approximately 723,000 to 578,000 gross square feet including an 8,000-gross-square-foot reduction to administration and common area space for the consolidation of SFMTA operations. Although the interior of the retained office wing would be renovated to serve the SFMTA's programmatic needs, reductions to the SFMTA program could result in the following:

- loss of approximately 145,000 gross square feet of space on floors 1 through 6 (which match up with the three transit levels), e.g., space for operator training, operator and administration areas, transit street operations, and electric bus battery infrastructure;
- displacement of maintenance bays including the tire shop, tire storage, tire bay and two body repair bays;
- loss of bus parking spaces on the second and third transit levels, limiting SFMTA's ability to meet the fleet plan mix of 40- and 60-foot-long buses; and
- loss of non-revenue vehicle parking spaces, limiting SFMTA's ability to consolidate transit street operations and other functions at Potrero Yard

Thus, under Alternative B, up to 16 maintenance bays could be developed and up to 194 buses and 76 non-revenue vehicles could be stored (fewer than the 18 maintenance bays and 310 parking spaces for 213 buses and 97 non-revenue vehicles under the proposed project or project variants and the transit fleet requirements [24 maintenance bays and 313 parking spaces for 216 buses and 97 non-revenue vehicles]). The residential component of the joint development uses would also be reduced compared to the proposed project or project variants (a reduction of 98 residential units) due to the retention of the office wing on the southeast portion of the site and the shifting of the multi-family residential development from the east portion of the site to the west. See **Table 5.3**, pp. 5.25-5.27 for a summary of how Alternative B meets the project's basic and additional objectives.

IMPACTS OF ALTERNATIVE B: FULL PRESERVATION ALTERNATIVE

Cultural Resources (Historic Architectural Resources)

EIR Section 3.B, Historic Architectural Resources, concludes that demolition of the 2500 Mariposa Street building (the Potrero car barn, constructed in 1915, and the office and shops wings, built in 1924 as second story additions) would cause a substantial adverse change in the significance of a historical resource.

Under Alternative B, the existing maintenance and operations building would be partially demolished and altered, but the most important feature of the building, the approximately 45-foot-tall, office wing that faces Mariposa Street, would be retained and rehabilitated. Furthermore, no additions would be constructed above this wing.

New construction rising up to 150 feet (multi-family residential floors on the 75-foot-tall transit facility podium) would be differentiated from the retained office wing through a program of setbacks along its north and west edges as well as a shift of multi-family residential floors to the west portion of the site. Alternative B would involve two further changes to the defining characteristics of the historical resource. The shops wing addition from 1924, as modified when Potrero Yard converted to a trolley bus facility, would be demolished, and the office wing's façade would be modified (including architectural detailing) to rehabilitate the westernmost bays along Mariposa Street. These bays would be modified to accommodate bus exit and other modern transit fleet needs related to turning dimensions and internal drive lanes.

However, the majority of the character-defining features would not be changed. Alternative B would change the physical appearance of the historical resource's site and environment, but the character of the historical resource would remain evident.

Overall, the massing of the office wing would be retained under Alternative B. The majority of the character-defining features of the historic resource, most notably the architectural detailing on the Mariposa and Hampshire Street elevations of the office wing, would also be retained (see **Table 5.2**, p. 5.23). The exterior elements identified as character-defining features would be restored with the exception of the shops wing, north of the office wing, which would be demolished. The character-defining features on this portion of the shops wing along Hampshire Street are limited as this elevation is mostly a blank façade with minimal detailing. Although the shops wing along Hampshire Street would not be retained, new construction would feature setbacks and reveals that allude to its original form and massing and provide a harmonious connection to the portion of the office wing that would be retained. Views of the most prominent character-defining features of the property, from the south on Mariposa Street (looking north) and from the east on Hampshire Street (looking west), would be retained with minimal change (see **Figure 5.3**, p. 5.40).

Alternative B would not apply conjectural features or architectural elements from other buildings to the historical resource in a way that would create a false sense of historical development, and new construction would be clearly differentiated from the retained office wing by location (setbacks from its north and west edges), building materials, and design. As noted, the two original openings at the west end of the Mariposa Street façade that were previously converted to doorways (i.e., the westernmost infilled with concrete and a roll-up door and the other infilled and converted into a pedestrian entrance for office access) would be restored for their original use as transit vehicle bays but adapted for modern transit fleet needs. These alterations would not create a false sense of historical development because they would restore character-defining features, based on available historic evidence.

Although there would be a change to the historical resource's environment, the historical resource would still retain its presence along Mariposa and Hampshire streets and its integrity as a two-story, reinforced concrete, post-earthquake streetcar barn designed in the Renaissance Revival style. The majority of the character-defining features of the historical resource would be retained with transit vehicle entry and exit bays along the full length of the Mariposa Street façade. All other character-defining features and spatial relationships would be retained to the maximum extent feasible. Therefore, Alternative B would retain the historical resource's character-defining exterior features including the form and massing of the office wing at Mariposa and Hampshire streets and to a lesser extent the form and massing of the shops wing along Hampshire Street. As such, the Potrero Trolley Coach Division Facility would retain its ability to convey the resource's historic and architectural significance. Alternative B would not cause material impairment to the historical resource and, unlike the proposed project or project variants, would not result in a significant and unavoidable impact related to demolition of a historical resource. Therefore, **Mitigation Measures M-CR-1a** through **M-CR-1d** would not be applicable under this alternative.

Air Quality

As identified in **EIR Section 3.E, Air Quality**, under **Impact AQ-3**, pp. 3.E.52-3.E.59, and **Impact C-AQ-1**, pp. 3.E.65-3.E.67, the construction-related activities of the proposed project or project variants would result in significant and unavoidable project and cumulative air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure, even with mitigation.

Alternative B would require similar site preparation activities, including demolition, and similar amounts of excavation as the proposed project or project variants. As a result, the construction-related air quality impacts of Alternative B would be similar to those of the proposed project or project variants, or reduced, as shown in **Table 5.4**, p. 5.29. However, the Alternative B construction program would be reduced by approximately 20 percent compared to the proposed project or project variants (from 1,300,000 gross square feet to 1,060,000 gross square feet). As with the proposed project or project variants, Alternative B contributions to emissions of toxic air

contaminants, such as diesel particulate matter, for construction and operational phases would be attributable to the number and types of on- and off-road construction equipment, the intensity of daily use of each piece of construction equipment, the number of construction truck trips (e.g., haul, concrete, materials), the addition of three onsite emergency diesel generators, and, increased vehicle trips attributable to construction workers and the proposed land uses. Alternative B would therefore require slightly less overall construction. For example, with less demolition debris and a slightly smaller overall structure, Alternative B would require fewer pieces of off-road construction equipment and fewer on-road construction truck trips. As a result, construction-related air quality emissions would be lower than those of the proposed project or project variants.

As with the proposed project or project variants, under Alternative B, implementation of **Mitigation Measure M-AQ-1: Off-Road Construction Equipment Emissions Minimization**, pp. 3.E.47-3.E.48, would also reduce construction-related emissions. However, unlike the proposed project or project variants, implementation of **Mitigation Measure M-AQ-1** would reduce Alternative B's construction-related contributions to emissions of toxic air contaminants, such as diesel particulate matter, from off-road equipment to a less-than-significant level. Because Alternative B would require less on- and off-road construction equipment than the project, **Mitigation Measure M-AQ-1** would effectively reduce project contributions to a level below the significance criterion for excess cancer health risk exposure (i.e., 7 parts per million).

Project-related and cumulative contributions of long-term operational emissions from the emergency diesel generators would be similar to that of the proposed project or project variants. **Mitigation Measure M-AQ-3: Emergency Diesel Generator Health Risk Reduction Plan**, p. 3.E.57, would require the use of exhaust and/or operational control measures for all emergency diesel generators to reduce the operational excess cancer health risk to a less than significant level.

Thus, because the construction-related activities that contribute to emissions of toxic air contaminants and lead to increased exposure of sensitive receptors to substantial pollutant concentrations and excess cancer health risk exposure would be substantially less under Alternative B and the use of emergency diesel generators under this alternative would be subject to **Mitigation Measure M-AQ-3**, project and cumulative air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations and excess cancer health risk exposure under Alternative B would be less than significant with mitigation, unlike with the proposed project or project variants.

Other Topics Covered in the EIR and Initial Study

Alternative B would occupy the same building site as the proposed project or project variants and have a similar, though less intensive, land use development program overall (1,300,000 gross square feet of development under the proposed project or project variants and 1,060,000 gross square feet under this alternative). Alternative B would require similar site preparation activities,

less demolition, and similar amount of excavation as the proposed project or project variants. As a result, the significant construction and operational impacts of Alternative B under the other EIR and initial study environmental topics would be similar to those of the proposed project or project variants but reduced, as shown in **Table 5.4**, p. 5.29. Impacts related to land use and planning, population and housing, greenhouse gas emissions, recreation, utilities and service systems, public services, and energy (discussed in the initial study [**EIR Appendix B**]) would be less substantial than those of the proposed project or project variants, given the reduced development intensity. These impacts would be less than significant, as with the proposed project or project variants.

The impacts of Alternative B related to site-specific conditions, such as those related to archeological resources and human remains, tribal cultural resources, transportation and circulation, noise and vibration, air quality, wind, shadow, biological resources, geology and soils (paleontological resources), hydrology and water quality, and hazards and hazardous materials, would be similar to those of the proposed project or project variants but reduced because Alternative B would reduce the size of the transit facility, including the space for administration and operations functions and the number of residential units, but would keep the commercial use and a similar excavation program for a proposed basement level. Specifically, the less-than-significant operational transportation and circulation impacts identified for the proposed project or project variants would be reduced slightly due to the reduction in the residential land use under Alternative B. Contributions to operational noise and air quality impacts under Alternative B would also be reduced incrementally from those under the proposed project or project variants, as a result of fewer daily and weekday p.m. peak hour vehicle trips. Alternative B would result in slightly less overall construction (e.g., with less demolition debris and a slightly smaller overall structure, there would be a slight reduction in the number of pieces of construction equipment and the number of construction truck trips) and less development intensity. As discussed above on p. 5.49, under Alternative B the construction program would be reduced by approximately 20 percent (from 1,300,000 gross square feet to 1,060,000 gross square feet). Thus, unlike the proposed project or project variants, under Alternative B implementation of **Mitigation Measure M-AQ-1**, pp. 3.E.47-3.E.48, would reduce the significant project and cumulative air quality impacts related to criteria air pollutant emissions (NOx) to less-than-significant levels. Thus, these air quality impacts would be less than significant or less than significant with mitigation, as with the proposed project or project variants.

As with the proposed project or project variants, potentially adverse construction-related effects under Alternative B in the environmental resources areas of seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (project site), and cultural resources (archeological resources and human remains) would be avoided or minimized through the incorporation of public works' SCMs as part of the project. For example, the incorporation of public works' **SCM #9, Cultural Resources**, and

SCM #7, Biological Resources, as part of Alternative B would avoid or minimize adverse effects on archeological resources and human remains and resident or migratory birds, respectively. Furthermore, the less-than-significant construction and operational transportation and circulation impacts would also occur under Alternative B; thus, **Improvement Measures I-TR-A: Construction Management Plan – Additional Measures** and **I-TR-B: Driveway and Loading Operations Plan** would still apply to Alternative B.

To address potential construction-related impacts on tribal cultural resources, **Mitigation Measure M-TCR-1** would still apply to Alternative B; this impact would be less than significant with mitigation. To address construction and operational noise and construction vibration, **Mitigation Measures M-NO-1**, **M-NO-2**, and **M-NO-3** would still apply to Alternative B; these impacts would be less than significant with mitigation. To address air quality impacts during construction and operation, **Mitigation Measures M-AQ-1** and **M-AQ-3** would still apply to Alternative B; these impacts would be less than significant with mitigation including the air quality impacts associated with criteria air pollutant emissions (NOx) from project construction and operation under project and cumulative conditions. To address paleontological resources impacts during construction, **Mitigation Measures M-GE-6a** and **M-GE-6b** would remain applicable to this alternative.

Alternative B would replace a paved bus storage yard and a predominately single-story building with a structure that has similar massing to the proposed project and project variants along its north and west edges. Where the prevailing winds would interact with the new structure under Alternative B, pedestrian wind hazards would be expected to be similar to those of the proposed project or project variants. Thus, a net new wind hazard location—at the sidewalk on northwest corner of the Bryant Street and Mariposa Street intersection—would also occur under Alternative B. To address wind impacts, **Mitigation Measure M-WI-1** would still apply to Alternative B; this impact would also be less than significant with mitigation. In addition, Alternative B would cast a similar shadow on Franklin Square to that cast by the proposed project or project variants, but would be slightly altered due to the change in the massing above the 75-foot-tall transit facility podium—from the east portion of the site to the southwest portion. Shadow impacts would be less than significant, as with the proposed project or project variants.

As with the proposed project or project variants, Alternative B would have no impacts on mineral resources, agriculture and forestry resources, and wildfire risk.

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ALTERNATIVE C: PARTIAL PRESERVATION ALTERNATIVE

DESCRIPTION

Under Alternative C, the office wing along Mariposa and Hampshire streets on the southeast portion of the site would be retained and reused. The remainder of the building would be demolished, including the shops wing along Hampshire Street north of the office wing. New construction (i.e., the three-level transit facility, with residential and ground-floor commercial uses plus residential uses atop the transit facility podium) would cover the remainder of the site as it does in Alternative B. See **Figure 5.5: Alternative C: Partial Preservation Alternative – Site Plan**, and **Figure 5.6: Alternative C: Partial Preservation Alternative – Massing Views**.

Similar to the proposed project or project variants, the building's three transit levels would rise to a height of 75 feet, with multi-family residential floors above rising to 150 feet (inclusive of the 75-foot-tall transit facility podium). The office wing would be retained and preserved in its entirety, with no new construction built on top of it. The remainder of the building would be demolished but the new building would feature some setbacks and notches to differentiate the new construction from the retained office wing. As under the proposed project or project variants, residential uses within the new transit facility under this alternative would be developed along Mariposa and Bryant streets and on floors above the transit facility podium. However, the footprint for residential development would be limited under Alternative C due to the retention of the office wing and the residential floor setbacks from the transit facility podium and retained office wing. Ground-floor commercial uses would be developed along Bryant Street as under the proposed project or project variants. Most of the character-defining features of the historical resource would be retained and reused, although to a lesser degree than in Alternative B. A portion of the existing structure would be retained; however, spatial relationships with the site and environment would be altered to a greater extent in Alternative C as compared to Alternative B.

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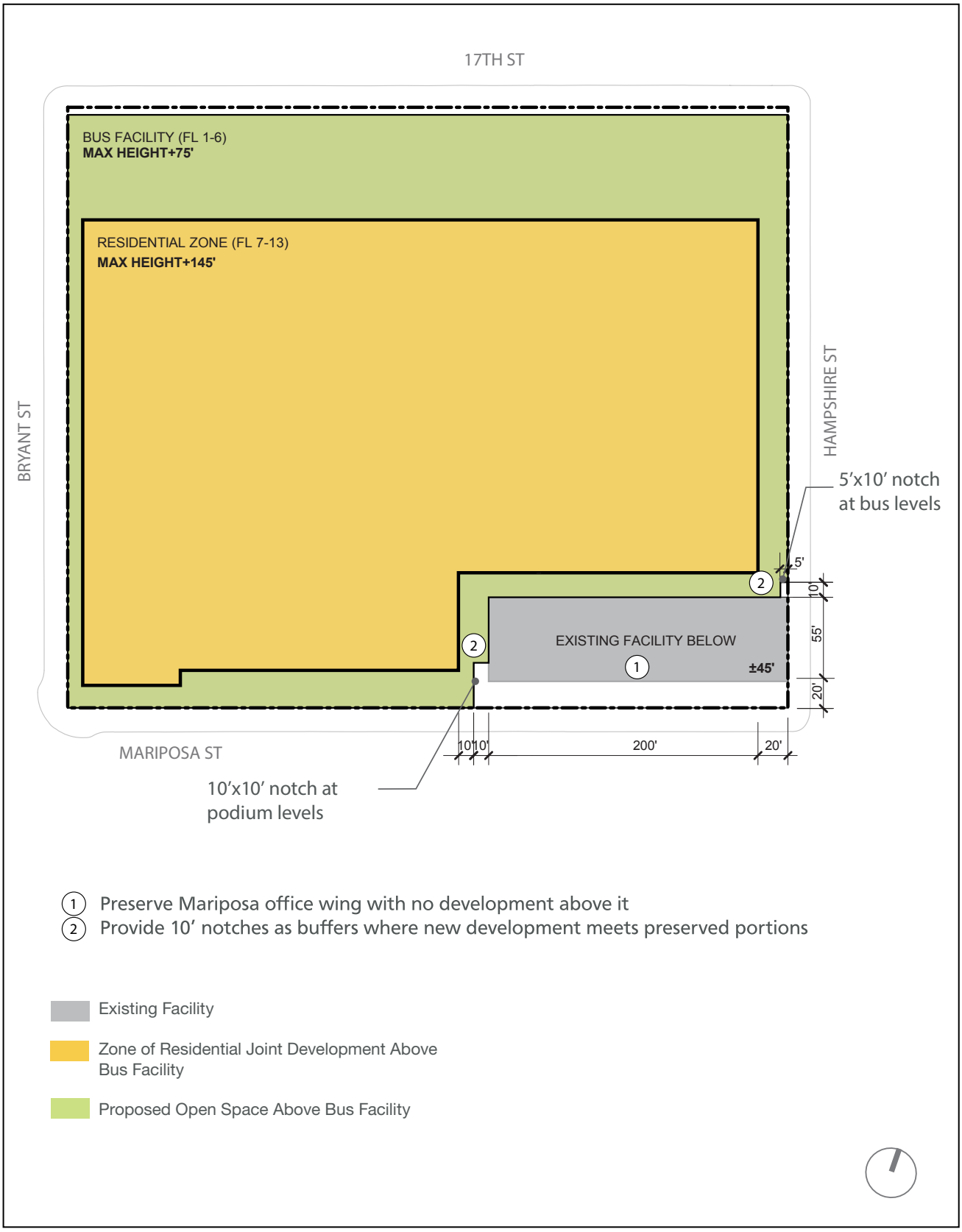

Source: SFMTA; SITELAB urban studio; HDR, March 2021

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FIGURE 5.5: ALTERNATIVE C: PARTIAL PRESERVATION ALTERNATIVE – SITE PLAN

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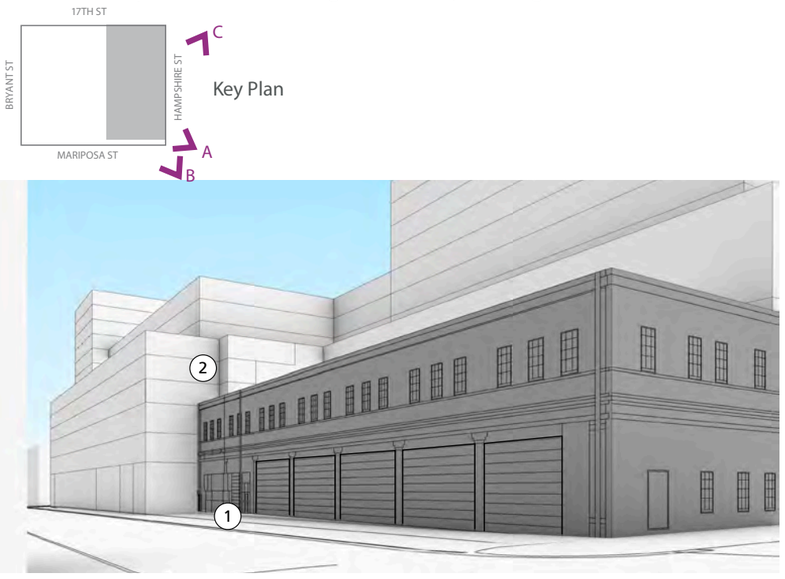
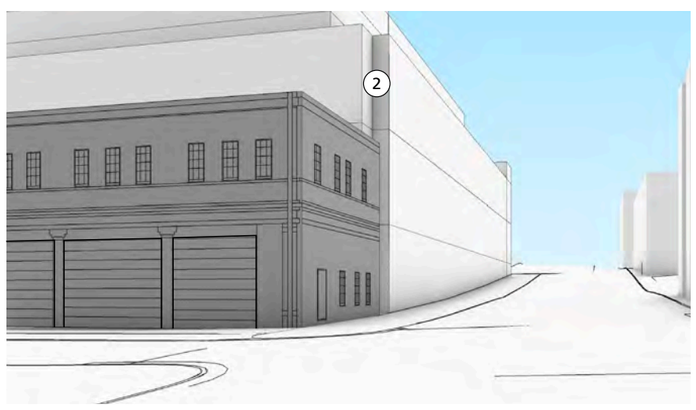
View A: Mariposa Street Looking Northwest, Existing

View B: Hampshire Street Looking North, Existing

View C: Hampshire Street Looking South, Existing

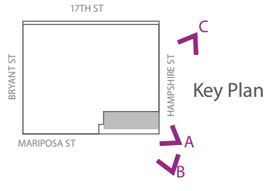


View A: Mariposa Street Looking Northwest, Proposed



View B: Hampshire Street Looking North, Proposed

View C: Hampshire Street Looking South, Proposed



KEYNOTES

1. Additional openings required for bus exit at maintenance bays
2. Provide 10' notches and stepback buffers where new development meets retained office wing

Retained Historical Resource

New Construction

Source: SFMTA; SITELAB urban studio; HDR, March 2021

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FIGURE 5.6: ALTERNATIVE C: PARTIAL PRESERVATION ALTERNATIVE – MASSING VIEWS

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Land Use Program

Alternative C would have a total of approximately 1,070,000 gross square feet of new and rehabilitated space, as follows:

- 551,000 gross square feet of space for bus storage and maintenance, ramps and circulation, and electric bus battery infrastructure
- 46,000 gross square feet of space for SFMTA administration and common areas
- 440,000 gross square feet of residential space with 459 residential units (110 studio, 165 one bedroom, and 184 two-plus bedroom)
- 33,000 gross square feet of ground-floor commercial space
- 84,000 square feet of open space

Site Redevelopment

Under Alternative C, the office wing would be retained in its entirety and restored, similar to Alternative B. The remainder of the building including the shops wing would also be demolished, similar to Alternative B. Façade modifications to the office wing would likely be needed to accommodate the functional needs of the new transit facility. The westernmost bays would need to be modified to accommodate optimal bus turn movements within the new facility before they could be reused as bus exit bays, similar to Alternative B. However, no vertical additions would be built above the retained office wing.

Alternative C would have the same footprint as Alternative B and the building's three transit levels (including a mezzanine level) would rise to a height of 75 feet, with the multi-family residential floors above rising to 150 feet. Under Alternative C, the Hampshire Street façade including the shops wing along Hampshire Street would not be retained, similar to Alternative B. Under Alternative C, all three transit levels of the proposed 75-foot-tall transit facility podium would be built to the Hampshire Street sidewalk with no setbacks and a reveal at the south end to differentiate it from the retained office wing; unlike Alternative B which would include a 15-foot setback from Hampshire Street at the third transit level and reveals of 5 feet deep by 10 feet wide at the north and south ends of the demolished shops wing. Under Alternative C the new transit facility would not be set back from the retained office wing. Two reveals, one measuring 10 feet wide by 10 feet deep on the west side of the office wing (facing Mariposa Street) and another 5 feet deep by 10 feet wide on the north side of the wing (facing Hampshire Street), would differentiate the retained office wing from the adjoining new construction. The proposed transit levels along Mariposa Street between Bryant and York streets would be built to the Mariposa Street property line, similar to Alternative B. The proposed 10-foot-by 10-foot notch would reveal a portion of the office wing's west façade (a much shallower reveal than under Alternative B by 45 feet). The first transit level, the mezzanine level, and the second transit level would connect to the rear of the retained office

wing, and the third transit level would rise above with no setback unlike Alternative B which would provide a 10-foot setback at the third transit level. Under Alternative C, the proposed transit levels along Hampshire Street between 17th Street and the retained office wing would be built to the property line. The new transit facility would feature a 5-foot-by-10-foot notch at the south end point of the demolished east façade of the shops wing to demarcate new construction.

Under Alternative C, the multi-family residential floors atop the 75-foot-tall transit facility would be oriented differently than under the proposed project or project variants, but would not be set back as substantially from the retained office wing as under Alternative B. Under Alternative C, the multi-family residential floors atop the transit facility and along Mariposa Street, immediately west and above the retained office wing (approximately 45 feet tall), would be set back 10 feet from the 75-foot-tall transit facility podium. When combined with the 10-foot by 10-foot notch proposed to reveal the office wings' west façade the overall setback from the retained office wing of the residential volume above the new transit facility would be 20 feet. Under Alternative C, the multi-family residential floors atop the transit facility and to the north of the retained office wing would be set back much closer than under Alternative B. Along Mariposa Street, the multi-family residential floors would be set back 15 feet from the edge of the transit facility podium and retained office wing, and 90 feet from the Mariposa Street property line. The multi-family residential floors to the west of Hampshire Street would be set back 20 feet from the transit facility podium and Hampshire Street property line.

Site Improvements, Access, and Circulation

Streetscape Changes

As with the proposed project or project variants, Alternative C would implement all the proposed streetscape changes with slight variations to the development of sidewalk extensions (i.e., 60-foot-long sidewalk extension and accessible loading zone on Hampshire Street north of Mariposa Street), location of curb cuts on Mariposa Street, and the tree planting program along Mariposa Street. See **Table 5.1**, pp. 5.18-5.22, for a summary of the streetscape improvements of Alternative C compared to those under the proposed project or project variants.

Vehicle Circulation

Under Alternative C, the vehicle (including bus) circulation system would be similar to the proposed project or project variants in that most buses would enter along Mariposa Street near Hampshire Street using the existing and rehabilitated entry bays and exit near York Street and between York and Bryant streets. The major circulation difference between this alternative and the proposed project or project variants is that the office wing would require two new exit bays at its west end near York Street and the current entry driveway to the paved storage yard (see **Figure 5.5**, p. 5.53).

Pedestrian Circulation

Under Alternative C, pedestrian circulation for SFMTA staff and the future residents and visitors would be similar to the proposed project or project variants. However, with a smaller footprint due to the retention of the office wing of the maintenance and operations building, a portion of the residential use would not be developed, including a joint development lobby on Mariposa Street between York and Hampshire streets. Thus, pedestrian access for SFMTA staff and future residents and visitors would be slightly different. Under Alternative C, primary access to ground-floor residential lobby spaces would be limited to the southwest corner of the site near Bryant and Mariposa streets, with secondary access at the northwest corner of the site near 17th and Bryant streets.

Freight and Passenger Loading Program

Under Alternative C, the freight and passenger loading program would be similar to that for the proposed project or project variants, e.g., off-street loading in the proposed basement level, and commercial freight and accessible passenger loading zones along Bryant Street, north of Mariposa Street (see **EIR Chapter 2**, pp. 2.45-2.46). However, the accessible passenger loading zone along Hampshire Street, north of Mariposa Street, would not be implemented.

Construction

Alternative C would require the same amount of excavation as the proposed project or project variants for the foundation and structural work and the below-grade basement. However, due to the retention and rehabilitation of the historic resource, Alternative C would generate less demolition debris. As with the proposed project or project variants, Alternative C would be constructed over three to four years. All public works' SCMs that would be incorporated as part of the proposed project or project variants would also be incorporated as part of Alternative C (see p. 5.59 and **Table 2.3** in **EIR Chapter 2, Project Description**, pp. 2.50–2.53). Due to the proposed modifications to the historic resource and its retention and reuse as part of a new transit facility (including those required for seismic considerations) and the direct adjacency of construction activities, the stricter requirements of public works' **SCM #9, Cultural Resources**, related to vibration would be incorporated as part of Alternative C unlike the proposed project or project variants and Alternative D. This would require the incorporation of vibration control procedures into all construction contracts. Among the requirements would be the development of a Vibration Control Plan that delineates a vibration-monitoring program to protect such properties from excess vibration during demolition and construction activities associated with the project.

ABILITY TO MEET PROJECT OBJECTIVES

Alternative C would have approximately 230,000 fewer gross square feet of space compared to the proposed project or project variants at 1,300,000 gross square feet. The replacement transit facility

would be reduced in size by 126,000 gross square feet—from approximately 723,000 to 597,000 gross square feet, including an 8,000-gross-square-foot reduction to administration and common area space for the consolidation of SFMTA operations. Although the interior of the retained office wing of the maintenance and operations building would be renovated to serve the SFMTA's programmatic needs, reductions to the SFMTA program could result in similar land use program reductions as with the Full Preservation Alternative (e.g., loss of programmable space on floors 1 through 6 due to retention and restoration of the historic office wing) as follows:

- loss of approximately 126,000 gross square feet of space on floors 1 through 6 (which match up with the three transit levels), e.g., operator training, operator and administration areas, transit street operations, and electric bus battery infrastructure;
- displacement of maintenance bays including the tire shop, tire storage and tire bay and two body repair bays;
- loss of bus parking spaces on the second and third transit levels, limiting SFMTA's ability to meet the fleet plan mix of 40- and 60-foot-long buses; and
- loss of non-revenue vehicle parking spaces, limiting SFMTA's ability to consolidate transit street operations and other functions at Potrero Yard

Thus, under Alternative C, up to 16 maintenance bays could be developed and up to 207 buses and 76 non-revenue vehicles could be stored (fewer than the 18 maintenance bays and 310 parking spaces for 213 buses and 97 non-revenue vehicles under the proposed project or project variants and the transit fleet requirements [24 maintenance bays and 313 parking spaces for 216 buses and 97 non-revenue vehicles]). The residential component of the joint development uses would also be reduced (a reduction of 116 residential units) due to the retention of the office wing on the southeast portion of the site. Commercial uses would be developed along Bryant Street as with the proposed project or project variants. See **Table 5.3**, pp. 5.25-5.27, for a summary of how Alternative C meets the project's basic and additional objectives.

IMPACTS OF ALTERNATIVE C: PARTIAL PRESERVATION ALTERNATIVE

Cultural Resources (Historic Architectural Resources)

The purpose of a partial preservation alternative is to consider a plan that would lessen the significant impacts of the proposed project or project variants on the existing historic resource. Under Alternative C, the office wing of the existing building would be retained and the remainder of the building including the shops wing along Hampshire Street would be demolished. As under Alternative B, although altered, most of the resource's original historical character would be retained. Furthermore, no additions would be constructed above the retained office wing.

New construction would be differentiated from the retained office wing through a program of setbacks along its north and west edges, but not as substantially as under Alternative B. Alternative C would involve the same changes to the defining characteristics of the historical

resource as Alternative B (demolition of the shops wing and modifications to the Mariposa Street façade for the westernmost bays). Although the majority of the character-defining features would not be changed, Alternative C would change the physical appearance of the historical resource's site and environment more substantially than under Alternative B. This is because the massing of the new construction on the east side of the site and to the north of the retained office wing would not respond to the historic massing and height of the shops wing along Hampshire Street.

Overall, the Mariposa and Hampshire Street façades of the office wing of the historical resource (i.e., the architectural detailing and massing of the office wing) would be retained under Alternative C, similar to Alternative B (see **Table 5.2**, pp. 5.23-5.24). Under Alternative C, the exterior elements identified as character-defining features would be restored except for the shops wing north of the office wing, similar to Alternative B. Unlike Alternative B, the new transit facility under Alternative C would not include a Hampshire Street setback at any of the new transit levels as a means to reflect the form and massing of the shops wing. Views of the most prominent character-defining features of the property, from the south on Mariposa Street (looking north) and from the east on Hampshire Street (looking west), would be retained, but with a more discernible change in massing between the scale of the new transit facility and the retained office wing (see **Figure 5.6**, p. 5.5).

Alternative C would not apply conjectural features or architectural elements from other buildings to the historical resource in a way that would create a false sense of historical development. Under Alternative C, the two original openings at the west end of the Mariposa Street façade that were previously converted to doorways would be restored for their original use as transit vehicle bays but adapted for modern transit fleet needs, similar to Alternative B. Additionally, new construction would be differentiated from the retained office wing by setbacks from its north and west edges, building materials, and design. As noted above for Alternative B, these alterations for Alternative C would not create a false sense of historical development because they would restore character-defining features, based on available historic evidence.

Although there would be a change to the historical resource's environment under Alternative C, the reinforced concrete, post-earthquake streetcar barn designed in the Renaissance Revival style would still retain its presence along Mariposa and Hampshire streets, but not to the same degree as under Alternative B. Alternative C would retain the office wing and all its associated character-defining features. However, unlike Alternative B, which would provide additional setbacks along Hampshire Street to allude to the original massing and scale of the historic resource, Alternative C would not incorporate these setbacks and the height and scale of new construction (ranging from 75 to 150 feet in height) would not be compatible with the overall height and massing of the historic resource. Although Alternative C would retain the office wing, the height and massing of the new construction would create a striking contrast with the overall height and massing of the historic resource. New construction under Alternative C would create a change in the overall visual

impression of the site and its environment, and would alter the historic resource's existing massing and scale. Thus, new construction would adversely affect the character-defining features associated with scale and massing that convey the property's historic and architectural significance as an early 20th-century car barn. Therefore, Alternative C would cause material impairment to the historic resource, resulting in an impact that would be significant and unavoidable with mitigation, but to a lesser extent than under the proposed project or project variants as character-defining features associated with the office wing would remain. **Mitigation Measures M-CR-1a** through **M-CR-1d** would be applicable under this alternative.

Air Quality

As identified in **EIR Section 3.E, Air Quality**, under **Impact AQ-3**, pp. 3.E.52-3.E.59, and **Impact C-AQ-1**, pp. 3.E.65-3.E.67, the construction-related activities of the proposed project or project variants would result in significant and unavoidable project and cumulative air quality impacts related to exposure of sensitive receptors to substantial pollution concentrations resulting in excess cancer health risk, even with mitigation.

As described under Alternative B, pp. 5.48-5.49, Alternative C would also require similar site preparation activities, including demolition, and similar amounts of excavation as the proposed project or project variants. As a result, the construction-related air quality impacts of Alternative C would also be similar to those of the proposed project or project variants, or reduced, as shown in **Table 5.4**, p. 5.29. The Alternative C construction program would also be reduced by approximately 20 percent compared to the proposed project or project variants (from 1,300,000 gross square feet to 1,070,000 gross square feet). Under Alternative C, implementation of M**itigation Measure M-AQ-1**, pp. 3.E.47-3.E.48, would also reduce construction-related emissions that contribute to the significant project and cumulative air quality impact related to exposure of sensitive receptors to substantial pollutant concentrations and excess cancer health risk exposure. However, unlike the proposed project or project variants, implementation of **Mitigation Measure M-AQ-1** would reduce Alternative C's construction-related contributions to emissions of toxic air contaminants to a less-than-significant level. Because Alternative C would require less on- and off-road construction equipment than the project, **Mitigation Measure M-AQ-1** would effectively reduce project contributions to a level below the significance criterion for excess cancer health risk exposure (i.e., 7 parts per million).

Project-related and cumulative contributions of long-term operational emissions from the emergency diesel generators would be similar to that of the proposed project or project variants. **Mitigation Measure M-AQ-3**, p. 3.E.57, would require the use of exhaust and/or operational control measures for all emergency diesel generators to reduce the operational excess cancer health risk to a less than significant level.

Thus, because the construction-related activities that contribute to emissions of toxic air contaminants and lead to increased exposure of sensitive receptors to substantial pollutant concentrations and excess cancer health risk exposure would be less under Alternative C and the use of emergency diesel generators would be subject to **Mitigation Measure M-AQ-3**, project and cumulative air quality impacts related to excess cancer health risk exposure under Alternative C would be less than significant with mitigation, unlike with the proposed project or project variants.

Other Topics Covered in the EIR and Initial Study

Alternative C would occupy the same building site as the proposed project or project variants and have a similar, though less intensive, land use development program overall (1,300,000 gross square feet of development under the proposed project or project variants and 1,070,000 gross square feet under this alternative). Alternative C would require similar site preparation activities, less demolition, and similar amount of excavation as the proposed project or project variants. As a result, the construction and operational impacts of Alternative C under the other EIR and initial study environmental topics would be similar to those of the proposed project or project variants but reduced, as shown in **Table 5.4**, p. 5.29. Specifically, impacts related to land use and planning, population and housing, greenhouse gas emissions, recreation, utilities and service systems, public services, and energy (discussed in the initial study [**EIR Appendix B**]) would be less substantial than those of the proposed project or project variants, given the reduced development intensity. These impacts would be less than significant, as with the proposed project or project variants.

The impacts of Alternative C related to site-specific conditions, such as those related to archeological resources and human remains, tribal cultural resources, transportation and circulation, noise and vibration, air quality, wind, shadow, biological resources, geology and soils (paleontological resources), hydrology and water quality, and hazards and hazardous materials, would be similar to those of the proposed project or project variants but reduced because Alternative C would reduce the size of the transit facility, including space for the administration and operations and the number of residential units, but would keep the commercial use and a similar excavation program for a proposed basement level. Specifically, the less-than-significant operational transportation and circulation impacts identified for the proposed project or project variants would be reduced slightly due to the reduction in the residential land use under Alternative C. Contributions to operational noise and air quality impacts under Alternative C would also be reduced incrementally from those under the proposed project or project variants – fewer daily and weekday p.m. peak hour vehicle trips. Alternative C would result in slightly less overall construction (e.g., with less demolition debris and a slightly smaller overall structure there would be a slight reduction in the number of pieces of construction equipment and the number of construction truck trips) and less development intensity. As discussed above on p. 5.61, under Alternative C the construction program would be reduced by approximately 20 percent (from 1,300,000 gross square feet to 1,070,000 gross square feet). Thus, unlike the proposed project or

project variants, under Alternative C implementation of **Mitigation Measures M-AQ-1**, pp. 3.E.47-3.E.48, would reduce the significant project and cumulative air quality impacts related to criteria air pollutant emissions (NOx) to less-than-significant levels. Thus, these air quality impacts would be less than significant or less than significant with mitigation, as with the proposed project or project variants.

As with the proposed project or project variants, potentially adverse construction-related effects under Alternative C in the environmental resource areas of seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (project site), and cultural resources (archeological resources and human remains), under Alternative C would be avoided or minimized through the incorporation of public works' SCMs as part of the project alternative. For example, the incorporation of public works' **SCM # 9, Cultural Resources**, and **SCM #7, Biological Resources**, would avoid or minimize adverse effects on archeological resources and human remains and resident or migratory birds, respectively. Furthermore, the less-than-significant construction and operational transportation and circulation impacts would also occur under Alternative C; thus, **Improvement Measures I-TR-A** and **I-TR-B** would still apply to Alternative C.

To address potential construction-related impacts on tribal cultural resources, **Mitigation Measure M-TCR-1** would still apply to Alternative C; this impact would be less than significant with mitigation. To address construction and operational noise and construction vibration, **Mitigation Measures M-NO-1**, **M-NO-2**, and **M-NO-3** would still apply to Alternative C; these impacts would be less than significant with mitigation. To address air quality impacts during construction and operation, **Mitigation Measures M-AQ-1** and **M-AQ-3** would still apply to Alternative C; these impacts would be less than significant with mitigation including the air quality impacts associated with criteria air pollutant emissions (NOx) from project construction and operation under project and cumulative conditions. To address paleontological resources impacts during construction, **Mitigation Measures M-GE-6a** and **M-GE-6b** would remain applicable to this alternative.

Under Alternative C, the prevailing winds would interact with a similarly shaped structure and pedestrian wind hazards would be expected to be similar to Alternative B and the proposed project or project variants. To address potential wind impacts, **Mitigation Measure M-WI-1** would still apply to Alternative C, and this impact would also be less than significant with mitigation. In addition, Alternative C would cast a similar shadow on Franklin Square to that cast by the proposed project or project variants, but it would be slightly altered due to the changes in the massing on the east portion of the site above the 75-foot-tall transit facility podium. Impacts would be less than significant, as with the proposed project or project variants.

As with the proposed project or project variants, Alternative C would have no impacts on mineral resources, agriculture and forestry resources, and wildfire risk.

ALTERNATIVE D: TRANSIT FACILITY PLUS COMMERCIAL ONLY ALTERNATIVE

DESCRIPTION

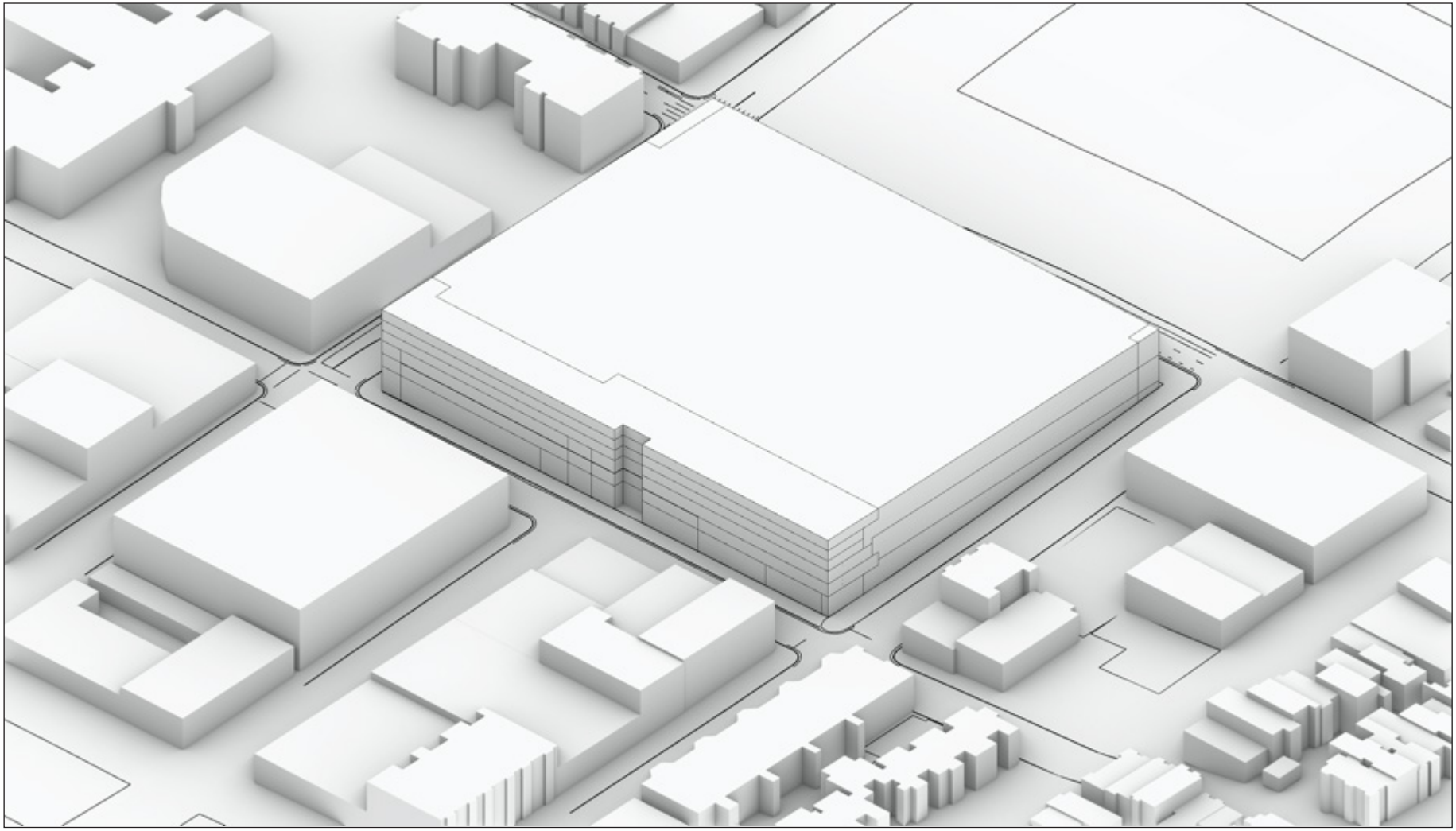
Under Alternative D, the 4.4-acre site would be redeveloped to provide a modern transit facility with commercial uses in a 75-foot-tall structure with three transit levels (see **Table 5.1**, pp. 5.18–5.22). However, Alternative D, unlike the proposed project and project variants, would not include residential uses within transit facility (along Mariposa and Bryant streets) or proposed residential development atop the transit facility podium (see **Figure 5.7: Alternative D: Transit Facility Plus Commercial Only Alternative – Site Plan**). All joint development space within the transit facility (as described in **EIR Chapter 2, Project Description** and shown on **Figure 2.12** to **Figure 2.16**, pp. 2.36–2.40) would be repurposed for SFMTA maintenance and circulation space, electric bus battery infrastructure, and staff amenities with the exception of ground-floor commercial space. The ground-floor commercial uses under the proposed project or project variants would be the same under Alternative D, with 33,000 gross square feet of commercial uses proposed along Bryant Street.

Streetscape improvements would be limited to a loading facility on Bryant Street for the commercial use, and the off-street loading at the basement level would be dedicated to the SFMTA. There would be no passenger loading space on Hampshire or Bryant streets north of Mariposa Street; thus, fewer parking spaces adjacent to the project site would be lost compared to proposed project or project variants.

Alternative D would require the same amount of excavation as the proposed project or project variants for the foundation and structural work and the below-grade basement. However, due to the smaller construction program for the transit facility and commercial space only, Alternative D could be constructed in 2.5 to 3 years, less than the three to four years expected for the proposed project or project variants. All public works' SCMs that would be incorporated as part of the proposed project or project variants would also be incorporated as part of Alternative D (see p. 5.64 and **Table 2.3** in **EIR Chapter 2, Project Description**, pp. 2.50–2.53).

ABILITY TO MEET PROJECT OBJECTIVES

Under Alternative D, most of the project's basic objectives would be met; however, fewer of the additional project objectives would be met because there would be no residential component to the joint development. See **Table 5.3**, pp. 5.25-5.27, for a summary of how Alternative D meets the project's basic and additional objectives.



Source: SFMTA; SITELAB urban studio; HDR, March 2021

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 5.7: ALTERNATIVE D: TRANSIT FACILITY PLUS COMMERCIAL ONLY ALTERNATIVE – SITE PLAN

IMPACTS OF ALTERNATIVE D: TRANSIT FACILITY PLUS COMMERCIAL ONLY ALTERNATIVE

Cultural Resources (Historic Architectural Resources)

Under Alternative D, the existing maintenance and operations building at 2500 Mariposa Street would be demolished as it would under the proposed project or project variants. As shown above in **Table 5.2**, pp. 5.23-5.24, Alternative D would not retain any of the character-defining features of the building that convey its eligibility for listing in the California Register. Therefore, Alternative D would cause material impairment to the historic resource, resulting in an impact that would be significant and unavoidable with mitigation, as under the proposed project or project variants. **Mitigation Measures M-CR-1a** through **M-CR-1d** would be applicable under this alternative.

Air Quality

As identified in **EIR Section 3.E, Air Quality**, under **Impact AQ-3**, pp. 3.E.52-3.E.59, and **Impact C-AQ-1**, pp. 3.E.65-3.E.67, the construction-related activities of the proposed project or project variants would result in significant and unavoidable project and cumulative air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations resulting in excess cancer health risk exposure, even with mitigation.

Alternative D would require similar site preparation activities, including demolition, and similar amounts of excavation as the proposed project or project variants. As a result, the construction-related air quality impacts of Alternative D would be similar to those of the proposed project or project variants, or reduced, as shown in **Table 5.4**, p. 5.29. The Alternative D construction program would be reduced by approximately 42 percent compared to the proposed project or project variants (from 1,300,000 gross square feet to 756,000 gross square feet). As with the proposed project or project variants, Alternative D contributions to emissions of toxic air contaminants, such as diesel particulate matter, for construction and operational phases would be attributable to the number and types of on- and off-road construction equipment, the intensity of daily use of each piece of construction equipment, the number of construction truck trips (e.g., haul, concrete, materials), the addition of two onsite emergency diesel generators (compared to three under the proposed project or project variants, or Alternatives B and C), and increased vehicle trips attributable to construction workers and the proposed land uses. Alternative D would result in substantially less overall construction. For example, because Alternative D would include a smaller overall structure, it would require fewer pieces of off-road construction equipment and on-road construction truck trips. As a result, construction-related air quality emissions would be reduced compared to those of the proposed project or project variants.

As with the proposed project or project variants, under Alternative D, implementation of M**itigation Measure M-AQ-1**, pp. 3.E.47-3.E.48, would also reduce construction-related emissions that contribute to the significant project and cumulative air quality impact related to health risk exposure. However, unlike the proposed project or project variants, implementation of **Mitigation Measure M-AQ-1** would reduce Alternative D's construction-related contributions to emissions of toxic air contaminants to a less-than-significant level because it would require substantially less on- and off-road construction equipment and shorter construction duration.

Under Alternative D there would be one less onsite emergency diesel generator than under the proposed project or project variants or preservation alternatives. Project-related and cumulative contributions of long-term operational emissions from the emergency diesel generators would be reduced compared to that of the proposed project or project variants. In addition, **Mitigation Measure M-AQ-3**, p. 3.E.57, would be applicable to this alternative due to the site being within the air pollutant exposure zone. **Mitigation Measure M-AQ-3** requires the use of exhaust and/or operational control measures for all emergency diesel generators to reduce the operational excess cancer health risk to a less-than-significant level.

Under Alternative D, **Mitigation Measures M-AQ-1** and **M-AQ-3** would effectively reduce project contributions to a level well below the significance criterion for excess cancer health risk exposure (i.e., 7 parts per million) and project and cumulative air quality impacts related to health risk exposure would be less than significant with mitigation, unlike with the proposed project or project variants.

Other Topics Covered in the EIR and Initial Study

Alternative D would occupy the same building site as the proposed project or project variants and have a similar, though less intensive, construction program (an approximately 42 percent reduction in the size of the proposed structure). The reduction to the land use development program would be attributable to the removal of the residential component of the project (i.e., the residential uses within the new transit facility podium and the multi-family residential floors above). Alternative D would require similar site preparation activities, including demolition, and similar amounts of excavation as the proposed project or project variants. As a result, the construction and operational impacts of Alternative D under the other EIR and initial study environmental topics would be similar to those of the proposed project or project variants or reduced, as shown in **Table 5.4**, p. 5.29. Specifically, impacts related to land use and planning, population and housing, greenhouse gas emissions, recreation, utilities and service systems, public services, and energy (discussed in the initial study [**EIR Appendix B**]) would be less substantial than those of the proposed project or project variants, given the reduced construction program and development intensity. These impacts under this alternative would be less than significant, as with the proposed project or project variants.

The impacts of Alternative D related to site-specific conditions, such as those related to archeological resources and human remains, tribal cultural resources, transportation and circulation, noise and vibration, air quality, wind, shadow, biological resources, geology and soils (paleontological resources), hydrology and water quality, and hazards and hazardous materials, would be similar to those of the proposed project or project variants but reduced because development pursuant to Alternative D would include the three-level, 75-foot-tall transit facility, eliminate the proposed residential use, and keep the commercial use only along with a similar excavation program for the proposed basement level. Specifically, the less-than-significant operational transportation and circulation impacts identified for the proposed project or project variants and preservation alternatives would be further reduced under Alternative D because of the removal of the residential land use. Contributions to operational noise and air quality impacts under Alternative D would also be reduced incrementally from those under the proposed project or project variants and preservation alternatives for the same reasons – fewer daily and p.m. peak vehicle trips and fewer pieces of on-site stationary equipment. For example, under Alternative D there would be one less onsite emergency diesel generator than under the proposed project or project variants and preservation alternatives. Because Alternative D would require similar site preparation activities, including demolition, as the proposed project or project variants, and would also have a similar excavation program for a proposed basement level, impacts related to tribal cultural resources, noise, air quality (criteria pollutants), geology and soils (paleontological resources), hydrology and water quality, and hazards and hazardous materials would be similar to those under the proposed project or project variants. Unlike the proposed project or other variants, Alternative D would result in substantially less overall construction (e.g., with a smaller overall structure there would be a substantial reduction in the number of pieces of off-road construction equipment as well as a decrease in the number of construction truck trips) and less development intensity. These impacts would be less than significant or less than significant with mitigation, as with the proposed project or project variants.

As with the proposed project or project variants, potentially adverse construction-related effects related to seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (project site), and cultural resources (archeological resources and human remains) under Alternative D would be avoided or minimized through the incorporation of public works' SCMs as part of the project. The incorporation of public work's **SCM #9, Cultural Resources**, and **SCM #7, Biological Resources**, would avoid or minimize adverse effects related to archeological resources and human remains, and resident or migratory birds, respectively. Furthermore, the less-than-significant construction and operational transportation and circulation impacts would also occur under Alternative D; thus, **Improvement Measures I-TR-A** and **I-TR-B** would still apply to Alternative D.

To address potential construction-related impacts on tribal cultural resources, **Mitigation Measures M-TCR-1** would still apply to Alternative D; this impact would be less than significant with mitigation. To address potential impacts associated with construction and operational noise and construction vibration, **Mitigation Measures M-NO-1**, **M-NO-2**, and **M-NO-3** would still apply to Alternative D; these impacts would be less than significant with mitigation. To address potential air quality impacts during construction and operation, **Mitigation Measures M-AQ-1** and **M-AQ-3** would still apply to Alternative D. Unlike the proposed project or project variants, with implementation of these mitigation measures under Alternative D, when considered in the context of its substantially reduced construction program (i.e., fewer pieces of off-road construction equipment and fewer construction truck trips for vendors and materials) and a reduction in the number of proposed emergency diesel generators, construction- and operational-related emissions associated with criteria air pollutant emissions (NOx) would be reduced and the impacts would be less than significant. To address potential paleontological resources impacts during construction, **Mitigation Measures M-GE-6a** and **M-GE-6b** would also remain applicable to this alternative.

Under Alternative D, the prevailing winds would interact with a similarly shaped transit facility structure and pedestrian wind hazards would be expected to be similar to Alternative B or C and the proposed project or project variants. Thus, a net new wind hazard location—at the sidewalk on northwest corner of the Bryant Street and Mariposa Street intersection—would also occur under Alternative D. To address wind impacts, **Mitigation Measure M-WI-1** would still apply to Alternative D; this impact would also be less than significant with mitigation. In addition, Alternative D would cast a smaller shadow on Franklin Square than that anticipated with the proposed project or project variants due to the removal of the multi-family residential floors above the 75-foot-tall transit facility podium. Impacts would be less than significant, as with the proposed project or project variants.

As with the proposed project or project variants, Alternative D would have no impacts on mineral resources, agriculture and forestry resources, and wildfire risk.

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C. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Pursuant to CEQA Guidelines section 15126.6(e)(2), if the no project alternative is the environmentally superior alternative, then an EIR is required to identify another environmentally superior alternative from among the alternatives evaluated if the proposed project has significant impacts that cannot be mitigated to a less-than-significant level. The environmentally superior alternative is the alternative that best avoids or lessens any significant effects of the proposed project, even if the alternative would impede to some degree the attainment of the project objectives. Alternative A: No Project Alternative is considered the overall environmentally superior alternative because it would not result in the significant impacts associated with implementation of the proposed project. Alternative A, however, would not meet any of the basic or additional project objectives the SFMTA described on pp. 5.4-5.5, above. For the reasons discussed below, Alternative B: Full Preservation Alternative would be the environmentally superior alternative among the other alternatives evaluated.

COMPARISON OF SIGNIFICANT IMPACTS OF THE PROPOSED PROJECT AND EIR ALTERNATIVES

To identify the environmentally superior alternative in accordance with the CEQA Guidelines, **Table 5.4**, pp. 5.29-5.35, presents a comparison of the significant impacts of the proposed project or project variants to those of the alternatives, as well as the comparative effects amongst the alternatives. The proposed project or project variants would result in significant impacts related to historic architectural resources, tribal cultural resources, noise and vibration, air quality, wind, and paleontological resources.

As shown in **Table 5.4**, pp. 5.29-5.35, Alternative A: No Project Alternative would represent a continuation of existing conditions on the project site and would not result in any significant impacts associated with implementation of the proposed project or project variants. As a result, Alternative A is considered the overall environmentally superior alternative; however, it would not meet any of the basic project objectives. Alternative D would substantially lessen the significant and unavoidable air quality impacts associated with exposure of sensitive receptors to excess cancer health risk but would not avoid or substantially lessen the historical architectural resources impact.

Alternative B: Full Preservation Alternative would therefore be the environmentally superior alternative because, of all the alternatives evaluated, it would have the fewest significant environmental impacts. Alternative B would retain and rehabilitate the existing office wing and develop the new structure with appropriate setbacks from the retained office wing. Additionally, the massing of new construction above the new transit facility would be shifted to the west portion of the site. As a result, it would avoid the significant adverse impact on the historical resource. Significant but mitigable construction- and operation-related tribal cultural resources, noise and

vibration, wind, and paleontological resources impacts would be similar to the proposed project or project variants and other alternatives. Unlike the proposed project or project variants implementation of **Mitigation Measure M-AQ-1** and **Mitigation Measure M-AQ-3** under each of the alternatives would reduce the proposed project's or project variants' significant and unavoidable air quality impacts, primarily as a result of the less intensive construction program for the incrementally smaller structures. In addition, Alternative B would not result in any new significant impacts or substantially more severe impacts as compared to the proposed project or project variants.

D. ALTERNATIVES CONSIDERED BUT REJECTED

Several preservation alternatives were considered as part of the alternatives scoping process for this EIR. CEQA Guidelines section 15126.6(c) states that an EIR should "identify any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." The scoping process for identifying viable EIR alternatives included consideration of the following criteria: ability to meet the basic project objectives; potential to substantially lessen or avoid significant environmental effects associated with the proposed project or project variants; and potential feasibility. As stated in CEQA Guidelines section 15126.6(f)(1), factors that may be considered when a lead agency is assessing the feasibility include:

> site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or the site is already owned by the proponent).

Several historic preservation alternatives were considered but rejected from further analysis because of they were deemed to be infeasible and/or because they would either address issues similar to the selected full and partial preservation alternatives but would not effectively reduce or lessen any significant impacts and would meet fewer of the project's basic objectives and additional objectives. As noted above on p. 5.3, an EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative but must consider a reasonable range of alternatives to foster informed decision-making and public participation. The discussion below describes the alternatives considered and the reasons why they were eliminated from consideration in the EIR.

PRESERVATION ALTERNATIVES CONSIDERED BUT REJECTED

FULL PRESERVATION ALTERNATIVE SCENARIOS

The rehabilitation of the existing maintenance and operations building was explored but determined to not meet the project's basic objectives for several reasons related to the existing maintenance and operations building's inability to accommodate modern bus yard operations, due to its age and design, as follows:

- The existing building was constructed to maintain and store early 20th century streetcars, which are smaller, lighter, and simpler to maintain than today's electric trolley buses. Due to original building design, the existing floor-to-ceiling heights do not provide enough space to allow for safe maintenance of roof-mounted components necessary for maintenance of modern vehicles. As a result, maintenance staff have assembled outdoor work areas with moveable catwalks that have no weather protection.
- The deficient floor-to-ceiling heights create conflict between the overhead wire system for the electric trolley buses and the maintenance activities that occur within the building which cannot be addressed in the existing configuration of the building.
- Additional limitations to efficient electric trolley bus maintenance flows are related to the service pits in the existing building, which are inadequate for chassis maintenance due to
    - Inadequate depth which does not allow for variable access based on employee height or component location,
    - lack of drainage, and
    - difficulty in maintaining compliant workforce safety (i.e., protection from falls).
- The maintenance bay configuration and geometry is now four to five buses deep, which hinders maintenance flows as buses cleared for service must wait behind disabled vehicles to clear the maintenance bay before they can proceed through.
- The existing building is setback approximately 20-feet from the Mariposa Street frontage, which detracts from the site's ability to accommodate the optimal bus to repair bay ratio to enable efficient bus maintenance in the facility.

As part of the development of a full preservation alternative, retention of the office wing and deeper setbacks from the existing resource's shops wing along Hampshire Street were considered—a 58-foot-deep setback that would retain the entire shops wing—and 25- and 30-foot-deep setbacks that would remove the shops wing but retain the Hampshire Street façade. Each of these options would progressively limit the functional effectiveness of the circulation ramps on the second and third transit levels and further reduce programmable space for SFMTA expansion and modernization, such as space for maintenance bays and shops; bus storage; infrastructure to support the all-battery electric bus fleet including non-revenue vehicles; and SFMTA training, operations, and staff space.

Strategies to address limited circulation space included the following:

- alterations to the location or length of circulation ramps as proposed; however, the ramps as proposed cannot be reduced substantially because they are near the minimum length and are at the maximum slopes allowed to accommodate the 40- and 60-foot-long buses that the facility will serve; and
- further reductions to bus and non-revenue vehicle storage to accommodate different bus circulation patterns.

These strategies would effectively limit the SFMTA from meeting most of the project's basic objectives identified in its fleet planning and facility capital programs primarily because Potrero Yard would not be able to accommodate the full complement of buses, bus types, and non-revenue vehicles projected to be housed at this facility. Further, many of the operational efficiencies that SFMTA envisioned for the proposed project or project variants would be constrained (e.g., training, operations, and staff space). These versions of a full preservation alternative were determined to not meet the basic objectives of the project and were rejected from further consideration.

The Full Preservation Alternative scenario presented to the HPC on October 7, 2020 (see pp. 5.39-5.51) would retain the office wing and the Hampshire Street façade and include a 15-foot setback for the second and third transit levels with additional setbacks for the new multifamily residential floors above the third transit level. The HPC acknowledged the challenge of developing a full preservation alternative that met most of the project's basic objectives. The HPC attributed greater importance to the retention of the office wing than the east elevation of the shops wing because most of the character-defining features are located along the Mariposa Street façade of the office wing as opposed to the east elevation of the shops wing which is largely a blank facade. The HPC rejected this full preservation scenario because they found retention of the east elevation of the shops wing did not improve the project from either a preservation or urban design perspective. Therefore, this Full Preservation Alternative was rejected from further consideration.

PARTIAL PRESERVATION ALTERNATIVE SCENARIOS

Partial Preservation Alternative (Mariposa Wing Façade 1)

Under this alternative, the maintenance and operations building would be demolished except for the primary street façade of the office wing along Mariposa Street that wraps around Hampshire Street. This façade would be preserved and incorporated into the new building. The new building's upper floors would be set back 10 feet from the retained portion of the building. This alternative would have allowed the proposed project or project variants to be built largely as proposed, but by retaining only the façade, the alternative would not sufficiently preserve the historic resource's character-defining features, including the height and massing of the office wing and the height and massing of the shops wing, and thus was incapable of avoiding or substantially reducing the environmental impact of the proposed project or project variants on historic architectural resources

in any meaningful way. Therefore, this partial preservation alternative was rejected from further consideration.

Partial Preservation Alternative (Mariposa Wing Façade 2)

This alternative would be similar to the rejected Partial Preservation Alternative (Mariposa Wing Façade 1), discussed above, except that the preserved Mariposa Street façade would be further differentiated from the replacement transit facility. This alternative would include a 10-foot-by-10-foot separation between new construction and the west edge of the Mariposa Street façade, as well as a 10-foot-by-5-foot separation between new construction and the north edge of the office wing's Mariposa Street façade that wraps around the southeastern corner and continues north along Hampshire Street. In addition to the setback along the west and north for the replacement transit facility's three new transit levels, the new building's upper floors would also be set back 10 feet from the retained portion of the building. This alternative would also have allowed the proposed project or project variants to be built largely as proposed but similar to the rejected Partial Preservation Alternative (Mariposa Wing Façade 1) described above, it would not reduce impacts to historic architectural resources in a meaningful way. Therefore, this partial preservation alternative was also rejected from further consideration.

These rejected partial preservation alternative scenarios differed in approach to Alternative C: Partial Preservation Alternative analyzed above. The major difference is the approach to historic preservation for these scenarios, which would be limited to façade retention with some limited differentiation between new construction and the retained façade. These partial preservation alternative scenarios would effectively demolish the building resulting in material impairment to the historical resource while still not retaining a portion of the building in a meaningful way. The planning department determined Alternative C: Partial Preservation Alternative provided a more meaningful approach to a partial preservation alternative because it maintained the overall volume and massing of the original historic resource rather than just retaining the facades of the building. Therefore, Alternative C: Partial Preservation Alternative was evaluated and these other partial preservation alternative scenarios were rejected from further consideration.

OTHER ALTERNATIVES CONSIDERED AND REJECTED

REDUCED DENSITY ALTERNATIVE TRANSIT FACILITY WITH JOINT DEVELOPMENT USES IN PODIUM ONLY

Under this alternative, no multi-family residential floors would be developed above the replacement transit facility, and there would be no construction above 75 feet. Rather, only a limited number of residential units could be developed along Mariposa and Bryant streets, similar to the proposed project or project variants. This alternative would be similar to the proposed project or project variants in all other respects, including development of 33,000 gross square feet of ground-floor

commercial uses. However, with no joint development above the replacement transit facility, the number of residential units would be significantly reduced in comparison to the proposed project or project variants or the preservation alternatives. This alternative would reduce the significant air quality impact related to health risk to less than significant with mitigation, similar to Alternative D. However, it would not reduce the significant historic architectural resources impact because the historic resource would be demolished. This alternative would meet most of the project's basic objectives, but it would not effectively meet some of the additional objectives related to the provision of housing. In particular, this alternative would drastically limit the number of residential units that could be built, and limit opportunities for the SFMTA to enter into a public/private joint development partnership. The full and partial preservation alternatives would provide more housing units and would also reduce the significant air quality impact for health risk to less than significant with mitigation. In addition, this alternative is within the range of alternatives provided by the preservation alternatives and the transit facility with commercial uses only alternative. For these reasons, this alternative was rejected from further consideration.

OFFSITE ALTERNATIVE

CEQA Guidelines section 15126.6(f)(2) states that alternative locations should be considered if they would avoid or substantially lessen any of the significant effects. An offsite alternative would consist of a project with design and programming similar to the proposed project or project variants. As described in **EIR Chapter 2, Project Description**, pp. 2.14-2.19, the SFMTA has been engaged in a multi-year transit fleet plan expansion and facility planning process that includes the redevelopment of a number of sites within the city that are City-controlled. These include the Muni Metro East swing facility in the Central Waterfront area (currently underway) and the Presidio and Kirkland yards. Other City-controlled storage and maintenance yards include the Woods Yard, the Islais Creek and Flynn Division facilities, and the 1399 Marin Street Facility. Each of the existing facilities are occupied and operating at or near their planned capacities. The SFMTA does not control vacant property of sufficient size to develop a new transit facility; therefore, the alternative location approach was not pursued.

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APPENDIX A

Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting, August 19, 2020

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
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Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting

Date:	**August 19, 2020**
Case No.:	**2019-021884ENV**
Project Title:	**Potrero Yard Modernization Project**
Zoning:	Public [P] Zoning District 65-X Height and Bulk District
Block/Lot:	Block 3971/Lot 001
Lot Size:	192,000 square feet
Project Sponsor	San Francisco Municipal Transportation Agency Licinia Iberri – 415.646.2715 Licinia.Iberri@sfmta.com
Lead Agency:	San Francisco Planning Department
Staff Contact:	Laura Lynch – 628-652-7554 CPC.PotreroYardEIR@sfgov.org

The San Francisco Planning Department (planning department or department) has prepared this notice of preparation of an environmental impact report (EIR) in connection with the Potrero Yard Modernization Project. The purpose of the EIR is to provide information about the potential significant physical environmental effects of the proposed project, to identify possible ways to minimize any potentially significant adverse effects, and to describe and analyze possible alternatives to the proposed project. The department is issuing this notice to inform the public and responsible and interested agencies about the proposed project and the intent to prepare an EIR, including a public scoping meeting to solicit comments on the scope of the EIR. The department will hold the public scoping meeting on Wednesday September 2, 2020 starting at 6 p.m. The department will hold the meeting using an online platform. You can view this notice and join the meeting via the online platform link found on the department's webpage, sfplanning.org/sfceqadocs; or via phone, using the following phone number and meeting identification number: 888-475-4499 (Toll Free) and Meeting ID: 925 7763 0432.

PROJECT SUMMARY

The project sponsor, the San Francisco Municipal Transportation Agency (SFMTA), proposes to replace the Potrero Trolley Coach Division Facility at 2500 Mariposa Street (Potrero Yard). The proposed project would accommodate the expansion of the SFMTA's transit vehicle fleet in a new replacement structure that would include space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses. The new, approximately 1,300,000 gross-square-foot structure would occupy the 4.4-acre site and rise to heights ranging from approximately 75 to 150 feet. The new structure would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the project as part of a joint development program

between SFMTA and a private project co-sponsor. The joint development program would include a ground-floor commercial use and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit facility. The majority of residential development would be atop the replacement transit facility on the 7th to 13th floors.

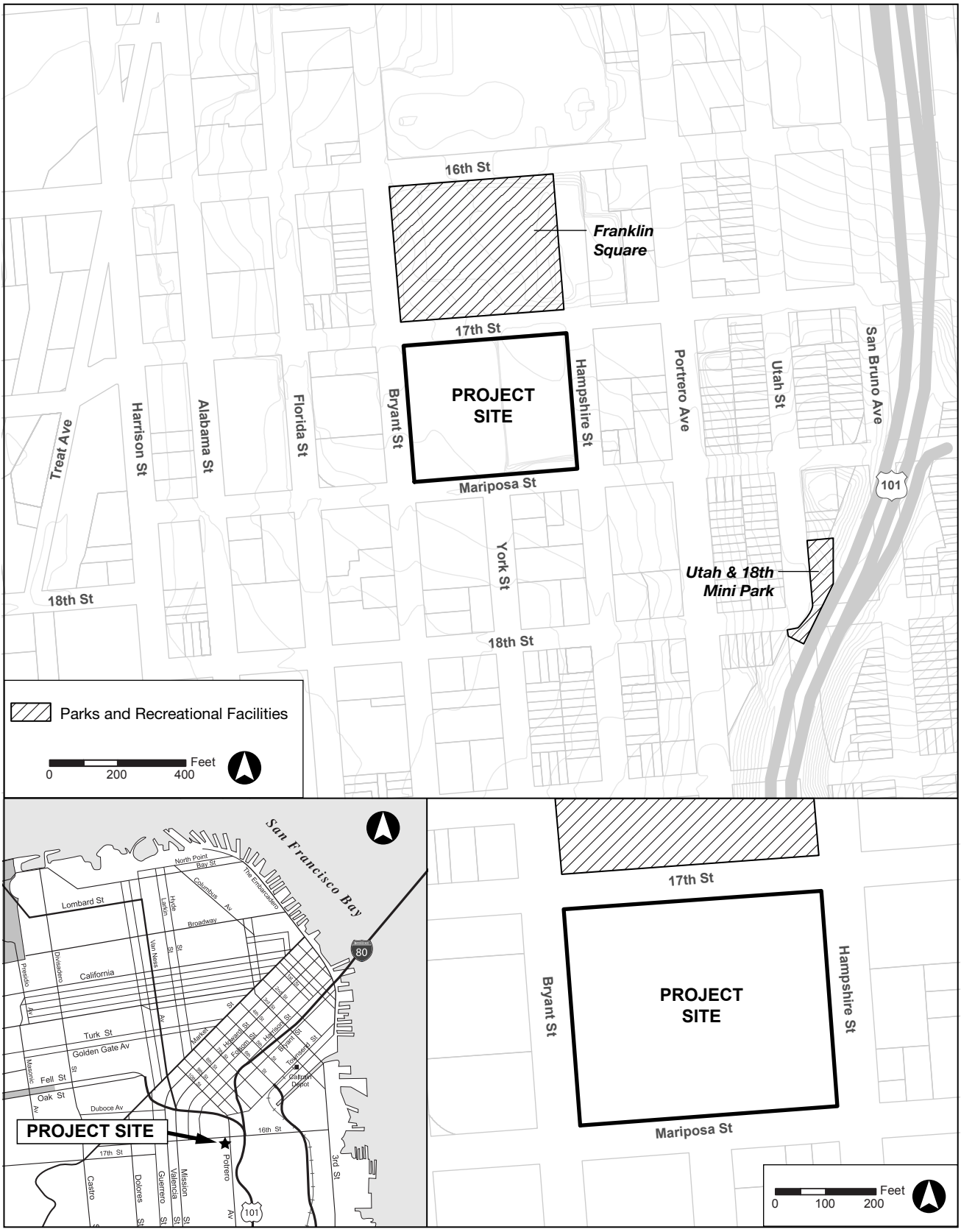
PROJECT LOCATION AND SITE CHARACTERISTICS

The project site is located in the northeast portion of San Francisco's Mission District near the South of Market and Potrero Hill neighborhoods (to the north and east, respectively). (See **Figure 1: Project Location**, p. 3.) The Potrero Yard site is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west and includes a trolley bus[1] storage yard and a maintenance and operations building. The project site is located across 17th Street from the approximately 4.4-acre Franklin Square and is approximately 0.25 mile west of U.S. Highway 101, approximately 0.5 mile east of the 16th and Mission Bay Area Rapid Transit District (BART) station, and approximately 0.5 mile north of San Francisco General Hospital.

The project site occupies the entirety of Assessor's Parcel 3971/001 and is owned by the City and County of San Francisco, through the SFMTA. The site is approximately 192,000 square feet (or 4.4 acres) and occupies the equivalent of roughly two typical city blocks (200 by 400 feet). The site is rectangular and measures approximately 480 feet along 17th and Mariposa streets and approximately 400 feet along Bryant and Hampshire streets. Potrero Yard includes a bus storage yard and a maintenance and operations building. The western half of the site, as well as the vacated York Street right-of-way, is occupied by the asphalt-paved bus storage yard, which includes a bus wash rack and running repair station along its northern and western edges, respectively. The eastern half of the site is occupied by the predominantly single-story maintenance and operations building, which includes a second-floor parking deck and a second story office level and maintenance bay along Mariposa and Hampshire streets, respectively. (See **Figure 2: Existing Site Plan**, p. 4.)

The site slopes up toward the north and east (17th and Hampshire streets) and downhill toward the south and west (Mariposa and Bryant streets). The bus storage yard (or western portion of the site) has a gradual elevation change of approximately 6 feet due to a cut into the natural slope of the site. As a result, along the northern boundary of the site, the elevation of 17th Street is between approximately 14 and 22 feet higher than site grade with the high point at the corner of 17th and Hampshire streets. The elevation change along the other boundaries of the site is smaller or at the same grade as the bus storage yard.

[1] Trolley buses (or trolley coaches) along with buses (or motor coaches) are part of the SFMTA's rubber-tired bus fleet. These vehicles are different from other buses based on the propulsion system. That is, trolley buses are all-electric vehicles that operate on overhead wires, while buses are outfitted with either diesel or hybrid motors that operate with renewable fuels. San Francisco Municipal Transportation Agency (SFMTA), SFMTA Bus Fleet Management Plan 2017-2030, March 2017, pp. 12-14. This document and all other documents cited herein, unless otherwise noted, are available for review at the San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, as part of Case No. 2019-021884ENV.

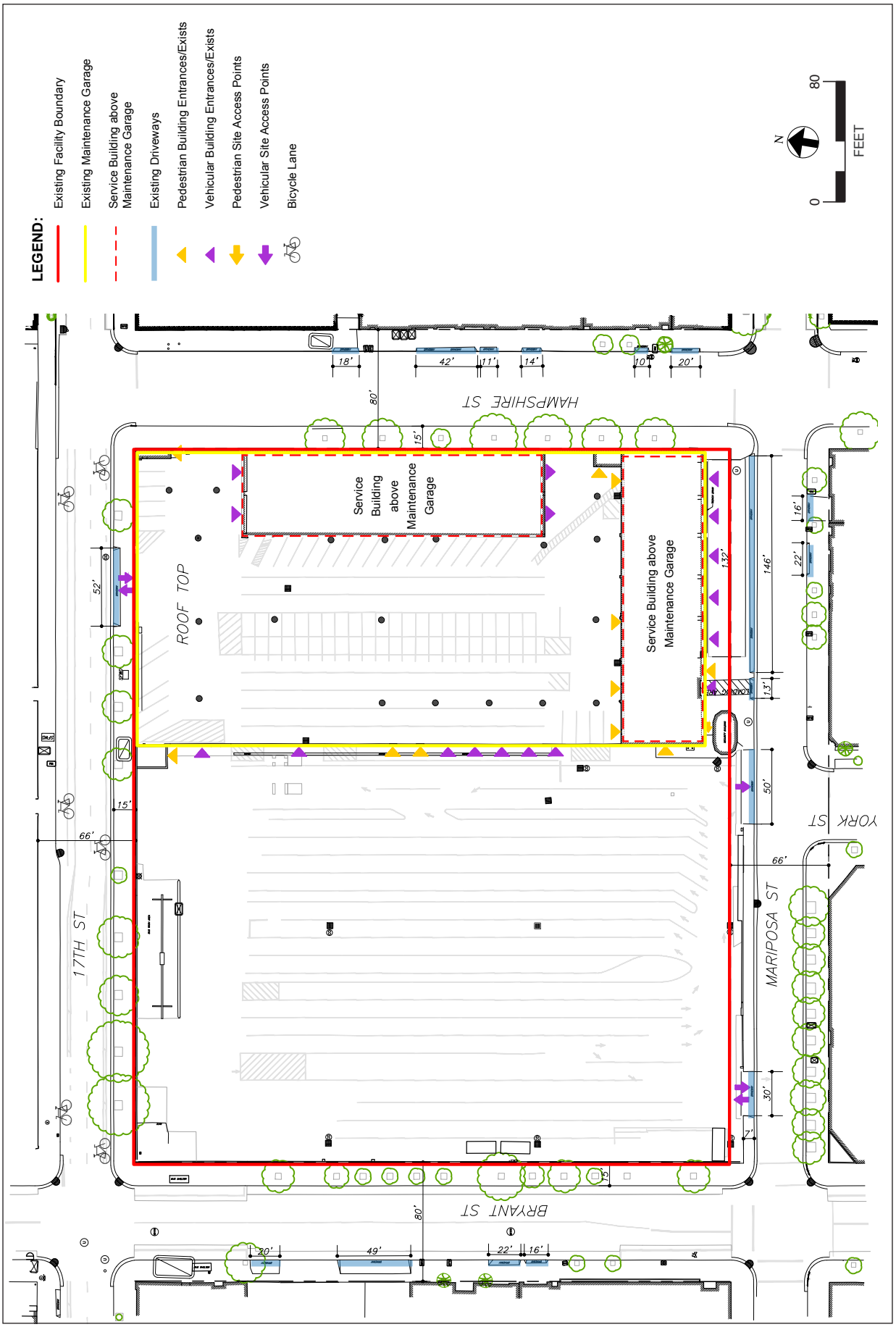


Source: SWCA, 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 1: PROJECT LOCATION



Source: Sitelab, 2020 and City & County of San Francisco

POTRERO YARD MODERNIZATION PROJECT
2019-021884ENV

FIGURE 2: EXISTING SITE PLAN

Existing Operations

Potrero Yard operates 24 hours per day, 7 days a week, providing overnight bus storage and a location for street operations and bus maintenance activities. Potrero Yard has a design capacity for 138 buses that are 40 and 60 feet long. Transit service demands for Muni routes operating out of Potrero Yard requires 158 buses to be stored and maintained at Potrero Yard, with buses parked in circulation aisles and maintenance bays.[2] The buses operate on six Muni routes – 5 Fulton, 5 Fulton Rapid, 6 Haight/Parnassus, 14 Mission, 22 Fillmore, and 30 Stockton – and carry over 102,000 Muni customers each day.[3] In general, the peak period for buses leaving Potrero Yard to access their routes is between 4 a.m. and 7 a.m., with the majority leaving between 5 a.m. and 6 a.m. Buses generally return to Potrero Yard in the evening between 7 p.m. and 9 p.m. Owl routes 5, 14, and 22 also emanate from Potrero Yard, with buses leaving before midnight and returning before 6 a.m. to provide owl service.[4] Bus travel to and from Potrero Yard is considered non-revenue bus travel time (i.e., buses are not in service picking up and dropping off passengers; they are traveling to or from Potrero Yard and a terminus point where revenue service begins or ends). Potrero Yard has approximately 400 employees, including approximately 295 bus operators.[5]

Existing Maintenance and Operations Building

The maintenance and operations building was originally constructed in 1915 as single-story, reinforced-concrete building and served as a streetcar maintenance garage with at-grade access from Mariposa Street. In 1924 the portions of the existing building along Hampshire and Mariposa streets were expanded to two stories. Between 1948 and 1949, the building was converted from a streetcar barn to a trolley coach facility. The maintenance and operations building covers less than 50 percent of the site. The rectangular building (215 by 370 feet) has a concrete perimeter foundation, a flat roof, and two double-height sections along its south (Mariposa Street) and east (Hampshire Street) sides. The building is approximately 109,000 gross square feet. Due to the elevation change, the building's height varies, ranging from approximately 44 feet tall along the Mariposa Street frontage near Hampshire Street, to approximately 10.5 feet tall along the Hampshire Street frontage near 17th Street.

Due to the change in grade between the north and south sides of the property, the first floor is below-grade on 17th Street and fully at-grade on Mariposa Street. Concrete retaining walls line the northern side of the site along 17th Street toward Bryant Street and a portion of the western side of the yard along Bryant Street toward 17th Street. The roof of the maintenance building is at grade along 17th Street west of Hampshire Street and is used as a parking deck. Additional maintenance shops are located on the second floor along the Hampshire Street side and offices on the second floor along the Mariposa Street side.

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[2] SFMTA, Short Range Transit Plan, Fiscal Year 2017-Fiscal Year 2030, June 6, 2017, Table 7: SFMTA Administrative, Operations, Maintenance, Fueling, Vehicle Storage and Staging Facilities, p. 19.
[3] SFMTA, Automatic Passenger Counts Data, 2019.
[4] SFMTA, Muni's late-night transit service is called the Owl network, https://www.sfmta.com/getting-around/muni/routes-stops/muni-owl-service-late-night-transportation, accessed July 10, 2020.
[5] SFMTA, Data Request Response, January 31, 2020.

The building's first floor, accessed from Mariposa Street, consists of a 10-lane maintenance space with 24 bays, including "heavy" and "running" repair bays[6], shallow maintenance pits, machine and tire shops, maintenance staff rooms, storage rooms, and offices. The second floor, accessed from 17th Street, houses two maintenance bays with tire and light-duty body repair shops and the operations department. All the maintenance-related spaces on the first and second floors have indoor overhead catenary systems attached to the ceilings to power the trolley buses.

The maintenance and operations building is eligible for inclusion in the California Register of Historical Resources (CRHR) under Criterion 1 (Events) for its association with the early days of the San Francisco Municipal Railway (Muni), and in particular the expansion of Muni service south of Market Street.[7] It also appears eligible for listing under Criterion 3 (Architecture/Design/Construction) as an example of a type (municipal car barn), period (World War I), method of construction (reinforced concrete), and the "work of a master," City Engineer Michael M. O'Shaughnessy. The maintenance and operations building is considered a moderately intact example of a municipal car barn. The department assigned the building a status code by of "3CS," meaning that it is already listed in the California Register and considered a historical resource for purposes of the California Environmental Quality Act (CEQA). The project site is not located within any known or potential historic district.[8]

Existing Bus Storage Yard and Other Paved Areas

The site has several paved areas and curb cuts. The existing electrified bus storage yard on the western portion of the site (approximately 112,450 square feet) is the largest of the paved areas. The bus storage yard is paved with asphalt, with painted and numbered parking lanes in the center of the yard. Overhead catenary lines mounted on steel poles provide power for off-duty electric buses stored and serviced on the yard. Several workstations are located around its perimeter, including a bus wash rack on the north side, an outdoor running repair station on the west side, and a fare collection shop and a defunct vacuum station on the east side. An entry control booth, built in 1990, is located west of a 25-foot-deep setback on the southeast portion of the site along Mariposa Street adjacent to the bus storage yard's main entrance.

Ingress to the bus storage yard is provided by a 50-foot-wide curb cut and gated driveway on Mariposa Street immediately west of the entry control booth; egress is provided by a 30-foot-wide curb cut and gated driveway on Mariposa Street near Bryant Street.

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[6] Running repair bays serve as preventative maintenance and inspection for buses that are still powered. Heavy repair bays typically are used for more intensive bus maintenance activities that could require lifts and other mechanical systems for engine overhauls or major body repairs.

[7] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, October 2, 2017, Section III, Regulatory Framework, p. 4.

[8] VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, October 2, 2017, Section VI, Determination of Eligibility, p. 65.

Other paved areas and curb cuts on the project site are as follows:

- A second-floor parking deck on top of the maintenance and operations building on the northeast portion of the site near 17th and Hampshire streets. The second-floor parking deck is accessed via a 52-foot-wide curb cut and gated driveway on 17th Street near Hampshire Street. The second-floor parking deck is electrified with overhead catenary wires mounted on steel poles.
- A 25-foot-deep strip of asphalt in front of five openings on the south elevation of the maintenance and operations building along Mariposa Street.[9] This strip of asphalt is in front of a continuous, approximately 146-foot-wide curb cut for buses to enter and exit the building.
- A 13-foot-wide curb cut, used to access a parts storeroom receiving area located immediately west of the main pedestrian entrance and east of the entry control booth via Mariposa Street.

The bus storage yard and second-floor parking deck provide space for the following:

- 158 buses (sixty-five 40-footers and ninety-three 60-footers)
- 56 non-revenue vehicles[10] and employee vehicles, in striped parking spaces currently located on the northeast side of the second-floor parking deck[11]
- 10 additional non-revenue vehicles, which are parked throughout the bus storage yard but not in marked spaces

In addition, one off-street loading space on the bus storage yard is located outside the parts storeroom receiving area east of the entry control gate on Mariposa Street. Off-street loading also occurs outside the maintenance bays on the second-floor parking deck.

Along 17th and Bryant streets and a portion of the Mariposa Street frontage, the bus storage yard is enclosed within 10-foot-high steel fencing topped with outward curving balusters.

Existing Site Access and Circulation

The project site is well served by public transit. Muni operates numerous surface buses within one block of the project site along Bryant Street, 16th Street, and Potrero Avenue, including the 9 San Bruno, 9R San Bruno Rapid, 22 Fillmore, 27 Bryant, 33 Ashbury/18th, and 55 16th Street routes. Six Muni bus routes operate out of the Potrero Yard: the 5 Fulton, 5 Fulton Rapid, 6 Haight/Parnassus, 14 Mission, 22 Fillmore, and 30 Stockton routes. Regional transit providers include BART, Golden Gate Transit, and San Mateo County Transit District (SamTrans).

Potrero Yard is not accessible to unaccompanied members of the public. Employees access the maintenance and operations building primarily from the entrance on Mariposa Street immediately east of the entry

[9] The 25-foot-deep setback at the southeast corner of site along Mariposa Street was originally required to allow streetcars, which cannot make 90 degree turns, sufficient clearance to turn off Mariposa Street into the building.

[10] Non-revenue means the SFMTA does not use the vehicles to collect fares from passengers. Non-revenue vehicles include, but are not limited to, cars, minivans, pick-up trucks, cargo vans, super-duty trucks, and tanker trucks. SFMTA, Short Range Transit Plan, Fiscal Year 2017-Fiscal Year 2030, June 6, 2017, p. 81.

[11] Fifty-two striped parking spaces are currently being used for bus parking.

control booth. Bus, non-revenue vehicles, and staff vehicles are able to access Potrero Yard from Mariposa Street via the 44-foot-wide gate just west of the entry control booth and the five bus bays near Hampshire Street, accessed via the 50-foot and 146-foot-wide curb cuts, respectively; and from the second-floor parking deck, accessed via a 52-foot-wide curb cut and gated driveway on 17th Street west of Hampshire Street.

The streets adjacent to the project site are identified as mixed-use streets in the Better Streets Plan[12] and described below.

- 17th Street is 66 feet wide with two travel lanes, striped bicycle lanes on both sides, and on-street parallel parking on the north side starting approximately 230 feet east of the Bryant Street intersection.[13]
- Hampshire Street is 80 feet wide with two travel lanes and perpendicular vehicle parking on both sides of the street.
- Mariposa Street is 56 feet wide with two travel lanes and on-street parallel parking on the north side of the street between the two gated entry and exit points to the bus storage yard and on the south side between Bryant and York streets and York and Hampshire streets.
- York Street terminates at Mariposa Street.
- Bryant Street is 80 feet wide with two north-south travel lanes, on-street parallel parking on both sides of the street, and Muni bus stops. The northbound (inbound towards Russian Hill) Muni bus stops are at the southeast corner of Bryant and Mariposa streets (south of the project site) and the southeast corner of Bryant and 17th streets (adjacent to the project site). The southbound (outbound towards the Mission) Muni bus stops are at the southwest corner of Bryant and 17th streets and the northwest corner of Bryant and Mariposa streets, both across the street from the project site.[14]

There are no on-street loading spaces adjacent to the project site.

The sidewalks adjacent to the project site along 17th, Hampshire, and Bryant streets are each 15 feet wide and meet the Better Streets Plan recommended sidewalk width. The Mariposa Street sidewalk is 7 feet wide and does not meet the minimum sidewalk width of the Better Streets Plan.[15] The existing bus storage yard encroaches on the Mariposa Street sidewalk right-of-way. Sidewalk elements include 27 street trees on the adjacent sidewalks: nine on 17th Street, seven on Hampshire Street, and 11 on Bryant Street. There are no street trees along the Mariposa Street frontage (see **Figure 2**, p. 4). Other sidewalk elements include the

[12] The San Francisco Better Streets Plan consists of illustrative typologies, standards and guidelines for the design of San Francisco's pedestrian environment, with the central focus of enhancing the livability of the City's streets. City and County of San Francisco, San Francisco Better Streets Plan, December 7, 2010, https://sfplanning.org/resource/better-streets-plan, accessed June 30, 2020.

[13] Along this segment of 17th Street the bikeway is a signed class II facility with a striped bike lane in both directions and elements of a class IV facility (i.e., a separated bike lane and flexible posts). The 17th Street bikeway continues east of Hampshire Street and west of Bryant Street as a mixed class II/class IV facility.

[14] There are class II striped bike lanes on each side of Bryant Street north of 17th Street.

[15] For this segment of Mariposa Street, the minimum and recommended sidewalk widths in the Better Streets Plan are 12 feet and 15 feet, respectively.

network of poles and overhead wires that serve the various Muni trolley buses maintained and stored at Potrero Yard. A Bay Area bicycle-share station with 19 bicycle docks is located at the northeast corner of Bryant and 17th streets, adjacent to the sidewalk.

Existing Zoning and General Plan Designation for the Project Site

The project site is located within a Public Use (P) Zoning District and a 65-X Height and Bulk District.[16, 17] The entire project site is within the Mission Alcohol Beverage Special Use District and Fringe Financial Services Restricted Use District, which include zoning controls to address specific land use issues related to the sale of alcoholic beverages and establishment of new fringe financial services, respectively.[18] It is also within the area covered by the Mission Area Plan of the San Francisco General Plan.[19]

PROPOSED PROJECT

The SFMTA proposes to replace the Potrero Yard at 2500 Mariposa Street. The project would accommodate the expansion of the SFMTA's transit vehicle fleet and the modernization of bus maintenance, operation, and administrative services. The project would also accommodate the expansion and consolidation of training operations currently sited elsewhere in one location. In addition, the proposed project includes joint development consisting of a mix of uses, such as residential within and atop the replacement transit facility and ground-floor commercial uses along Bryant Street.

In addition, the proposed project also includes four variants that consider modifications to limited features or aspects of the project. A brief description is provided below under "Project Variants," p. 41.

Project Background

The proposed project is part of the SFMTA's 20-year Building Progress Program to expand and modernize its facilities to meet growing transportation demands and changing technologies.[20, 21] In addition to the Potrero Yard, the SFMTA operates five other bus yards, sometimes referred to as "divisions": Presidio Yard (949 Presidio Avenue), Flynn Division (1940 Harrison Street), Woods Yard (1095 Indiana Street), Islais Creek Division (1301 Cesar Chavez Street), and Kirkland Yard (2301 Stockton Street and 151 Beach Street).[22]

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[16] The maximum building height allowed on the project site is 65 feet. Bulk controls reduce the size of a building's floorplates as the building increases in height. Pursuant to the San Francisco Planning Code, Article 2.5: Height and Bulk Districts, Section 270(a), there are no bulk limits in an "X" Bulk District.

[17] San Francisco Planning Department, San Francisco Property Information Map, Step 1: 2500 Mariposa Street, and Step 2: Zoning Information, http://propertymap.sfplanning.org, accessed July 25, 2020.

[18] San Francisco Planning Code, Article 2: Use Districts, Sections 249.35 and 249.60.

[19] San Francisco Planning Department, San Francisco General Plan, Eastern Neighborhoods Planning Areas, http://generalplan.sfplanning.org/images/eastern_neighborhoods_map.pdf, accessed July 24, 2020.

[20] SFTMA, Building Progress Public Outreach Boards, January 24, 2018, p. 5.

[21] SFMTA, 2017 SFMTA Facilities Framework, p. 8.

[22] SFMTA, 2017 SFMTA Facilities Framework, p. 14.

The SFMTA is increasing its transit fleet to meet growing transportation demands. By 2025, SFMTA will have 55 more rubber-tired buses than can physically fit in its six current facilities; by 2030, that number will increase to 62. In addition, its oldest transit facilities – Potrero, Presidio, and Kirkland yards – were not built for the buses they currently store there, and are not equipped with adequate bus maintenance infrastructure or equipment, including bus lifts. The Potrero and Presidio yards were built for streetcars and modified for buses within their existing footprints; they have never truly served for efficient bus maintenance. They also do not meet the needs of new bus types or technologies such as battery-electric bus infrastructure. SFMTA therefore undertook a planning process for expanded and modern transit facilities.[23]

In 2015 the SFMTA began a facility condition assessment to identify deficiencies and repair costs as a basis for budgeting and prioritizing improvements, as well as a means of identifying major space planning opportunities and ways to improve processes for facility planning and management.[24] SFMTA staff held internal staff workshops with front-line transit operations and maintenance staff and management in late 2015, early 2016, mid-2016, and late-2016. SFMTA staff presented a Facilities Framework to the SFTMA Executive Team in December 2016. The SFMTA Executive Team provided direction to study three development scenarios: Scenarios 1A and 1B, which propose smaller rebuilt facilities because they assume an additional new site, and Scenario 2A, which optimizes use of the SFMTA's existing sites, including replacing Potrero Yard.[25]

In November and December 2017 and January and December 2018, the SFMTA held public meetings to discuss the critical need to modernize SFMTA facilities such as Muni yards, maintenance shops, and paratransit facilities.

SFMTA held public workshops on the redevelopment of the Potrero Yard in December 2018 and in February, August, and October 2019. The SFMTA also conducted two years of internal design and planning work and coordinated with the Potrero Yard Neighborhood Working Group[26].

Based on those efforts, the SFMTA decided to study only Scenario 2A further. This scenario proposes rebuilding the three oldest facilities – Potrero, Presidio, and Kirkland yards, including the potential for additional joint development on these sites. The SFMTA is proposing to proceed with Potrero Yard first, as described herein.

[23] SFMTA, 2017 SFMTA Facilities Framework, p. 8.
[24] SFMTA, 2017 SFMTA Facilities Framework, p. 6.
[25] SFMTA, 2017 SFMTA Facilities Framework, p. 10.
[26] The Potrero Yard Neighborhood Working Group has approximately 15 members selected by the SFMTA in consultation with the Supervisors of Districts 9 and 10. Each seat represents a specific interest in elements of the project, https://www.sfmta.com/reports/potrero-yard-neighborhood-working-group-application-form, accessed May 30, 2020.

The City and County of San Francisco (the City), acting by and through the SFMTA, will select a master developer (or a development consortium) to redevelop the 4.4-acre site through a developer selection process consisting of a request for qualifications (released June 2020) and a subsequent request for proposals (expected fall 2020) from the qualified candidates. The SFMTA anticipates selecting a developer in January to March 2021 and contracting with a developer by April to June 2021.

The proposed project described below and summarized in **Table 1: Summary of Existing and Proposed Project Characteristics**, pp. 13-14, is conceptual at this early stage in process. This document describes the project's characteristics as they would occur if decision makers approve the project. However, as with most large development projects, aspects of the proposed project's conceptual design may change and will become more detailed as a result of the CEQA process, technical design modifications, planning and building department application submittal requirements, and input from the planning department, the community, the selected project developer, and other stakeholders. For example, the project's massing, shown in Figures 4 through 11 on pp. 17 to 24 of this document, may change from the maximum envelope proposed to be analyzed as part of the CEQA analysis to a more refined architectural expression in response to design guidelines to be developed as part of the SFMTA's developer selection process and through the City's design review process.

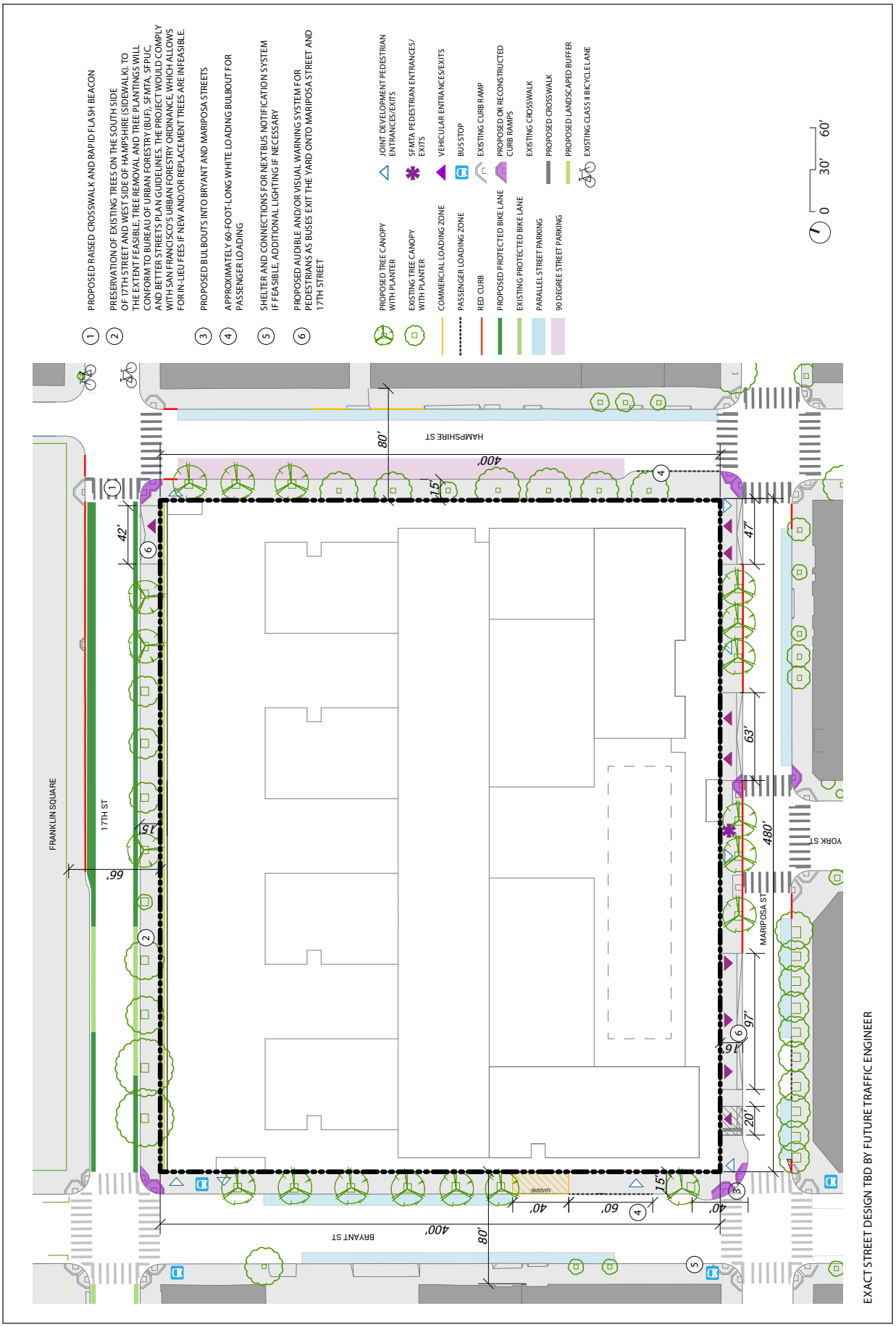
The planning department will evaluate whether any future changes from the sponsor to the project description described herein would necessitate additional environmental review because, for example, the change would result in new or more substantial significant impacts.[27]

Project Characteristics

The proposed project would demolish the existing bus storage yard and the maintenance and operations building and would replace them with a new, approximately 75- to 150-foot-tall,[28] up to 1,300,000-gross-square-foot structure. The proposed structure would cover the entire lot, except for a 5-foot setback from 17th Street. (See **Figure 3: Proposed Site Plan**.) The characteristics of the proposed development are summarized in **Table 1: Summary of Existing and Proposed Project Characteristics**, pp. 13-14.

[27] Refer to CEQA Guidelines sections 15088.5 "Recirculation of an EIR prior to certification" and 15162 "Subsequent EIRs and Negative Declarations" for more details regarding the criteria applicable to the planning department's evaluation of refinements to the project description. Such subsequent environmental review may include revisions to the draft EIR, a subsequent EIR or addendum or similar documentation.

[28] Maximum building height would be measured from grade at the midpoint of the property boundary along each elevation pursuant to section 260 of the planning code.



EXACT STREET DESIGN TBD BY FUTURE TRAFFIC ENGINEER

Source: SFMTA and Sitelab, 2020

FIGURE 3: PROPOSED SITE PLAN

POTRERO YARD MODERNIZATION PROJECT

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Table 1: Summary of Existing and Proposed Project Characteristics

Building Characteristics	Demolished	New [NOTE A]
Paved Bus Storage Yard	**112,450 sq. ft.**	–
Total Building Floor Area	**109,000 gsf** [NOTE B]	**1,300,000 gsf**
Ramps and Circulation		463,000 gsf
Service/Storage (Basement)		127,000 gsf
Service/Storage (Non-Basement)		59,000 gsf
Administration & Common Area		52,000 gsf
Shared Basement Circulation (Ramps and Drives)	–	22,000 gsf
Transit Facility Subtotal	**221,450 gsf** [NOTE C]	**723,000 gsf**
Residential (Units)	–	394,000 gsf
Residential (Circulation, Common Area, Property Management, Service, Storage)	–	150,000 gsf
Residential Development Subtotal	–	**544,000 gsf**
Commercial Use	–	33,000 gsf
Commercial Development Subtotal	–	**33,000 gsf**
Height	**10.5 – 44 feet**	**75 – 150 feet** [NOTE D]
Levels or Floors	**1 to 2**	**3 to 13**
Residential Units [NOTE E]	**0**	**575**
Two- to Three-Bedroom	–	228
One-Bedroom	–	206
Studio	–	141
Vehicle Parking Spaces	**214**	**310** [NOTE F]
Buses (40 foot / 60 foot)	158 (65 / 93)	213 (63 / 150)
Non-Revenue Vehicles (large / standard)	56	97 (8 / 89)
SFMTA Staff	–	0
Residential	–	0
Loading Supply (On-Street Zones / Off-Street Spaces)	**0 curb feet (0 / 1)**	**160 curb feet (3 / 2)**
Commercial (On-Street / Off-Street)	0 curb feet (0 / 1)	40 curb feet (1 / 2)
Passenger (On-Street / Off-Street)	–	120 curb feet (2 / 0) [NOTE G]
Bicycle Parking Spaces [NOTE H]	**5**	**773**
Class 1	0	736
Class 2	5	37
Useable Open Space – Atop Replacement Transit Facility	–	**91,000 sq. ft.**
At-Grade Open Space – Green Buffer along 17th Street	–	**2,400 sq. ft.**

Notes: gsf = gross square feet; sq. ft. = square feet

NOTE A Numbers rounded to closest 1,000 gsf or sq. ft. and correspond to the current conceptual design of the proposed project. The values presented are the expected maximum size for each component to provide a conservative analysis of impacts. The floor areas of the final design may result in variances from the values presented.

NOTE B Includes space for bus circulation, service, storage, administrative offices, and common areas.

NOTE C Includes the paved bus storage yard.

NOTE D The replacement transit facility would have three levels and be approximately 75 feet tall, as measured from grade at the midpoint of the property boundary along each elevation pursuant to San Francisco Planning Code (planning code) section 260.

Building Characteristics	Demolished	New [NOTE A]

NOTE E The proposed project may include as few as 525 units, but the analysis assumes up to 575 units. Approximately 40 percent of all residential units would be two-bedroom units, with up to 15 percent of two-bedroom units potentially becoming three-bedroom units. Approximately 50 percent of residential units would be market rate, and the other 50 percent would be below market rate residential units.

NOTE F Up to 12 car-share spaces may be provided at the basement level.

NOTE G Two separate 60-foot-long zones.

NOTE H Class 1 bicycle parking facilities are spaces in secure, weather-protected facilities intended for use as long-term, overnight, and workday bicycle storage by unit residents, non-residential occupants, and employees. Class 2 spaces are bicycle racks located in publicly accessible and highly visible locations intended for transient or short-term use by visitors, guests, and patrons to the building or use. Class 2 bicycle racks allow the bicycle frame and one wheel to be locked to the rack (with one u-shaped lock) and provide support to bicycles without damage to the wheels, frame, or components (planning code section 155.1).

Source: SFMTA 2019

As shown in **Table 1**, the proposed approximately 1,300,000-gross-square-foot structure would contain an approximately 723,000-gross-square-foot replacement transit facility and up to 577,000 gross square feet of joint development uses. The replacement transit facility will have three transit levels, and a portion of the joint development, with integrated residential and commercial uses proposed along the Mariposa Street and Bryant street frontages (for a total of six joint development floors within the three-level replacement transit facility). Much of the residential portion of the joint development program would be developed within the three to seven floors proposed to rise above the replacement transit facility, i.e., on joint development floors 7 through 13. The tallest portion of the additional residential development atop the replacement transit facility will be closest to Mariposa Street on the site's south side. Useable open space (see **Table 1**) would be developed on the rooftop of the replacement transit facility, e.g., where the structure is set back from the property lines.

The three new transit levels in the replacement transit facility would be designed to include space for circulation (ramps, drive aisles, and vertical circulation), parking for 213 buses, 18 maintenance bays and maintenance support areas, operations, an SFMTA operator training center, storage (parts and battery-electric infrastructure), administrative uses/common areas (e.g., offices, conference rooms, break rooms), and joint development uses.[29] A total of 310 vehicle spaces would be provided: 63 spaces for the 40-foot-long buses, 150 spaces for the articulated 60-foot-long buses, and 97 parking spaces for large and standard non-revenue vehicles. The project is not proposing any off-street accessory vehicular parking for the entirety of the project, including the proposed joint development. See **Table 1**, pp. 13-14, for the parking breakdown and for approximate floor areas for the replacement transit facility. Ramps would provide one-way internal driveways within the replacement transit facility so that buses can access the work bays, bus wash bays, and parking spaces on the three new transit levels.

The proposed joint development uses within the replacement transit facility (ground-floor commercial and residential) and proposed residential uses on the up to seven floors atop the replacement transit facility

[29] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: Bus Facility Design Criteria Document, June 2019, Section 3.3 (Potrero Facility Scenario 2), p. 27.

would include space for up to 575 residential units. Up to 33,000 square of ground-floor commercial use would also be developed along Bryant Street. See **Table 1**, pp. 13-14, for the breakdown of units by unit type and for approximate floor areas for the residential and commercial uses.[30, 31]

Circulation space for the proposed transit, residential and commercial uses would be provided at the basement level and each of the six joint development floors within the replacement transit facility. Residential levels within the replacement transit facility would be accessed via vertical circulation access points that preserve the security of the SFMTA facility and that are safe and functional for the joint development. Access to the residential levels atop the replacement transit facility would be provided via separate residential circulation elevators and stairs. A secure access system would be installed to restrict access to various floors to authorized individuals (e.g., residents only at the residential floors and SFMTA employees only at SFMTA floors).

The proposed project would also include changes within the Mariposa Street, 17th Street, Bryant Street, and Hampshire Street rights-of-way, as discussed below under "Proposed Changes in Street Rights-of Way" beginning on p. 35.

During construction, the bus parking, operations, and maintenance support functions would temporarily relocate to the Muni Metro East Light Rail Vehicle Facility (601 25th Street), and the 1399 Marin Facility.[32] The SFMTA estimates that the replacement transit facility would have a total employment population of approximately 829 full-time equivalent persons, including 383 operators.[33] Potrero Yard would continue to operate as a 24/7 facility. On average, approximately 100 SFMTA staff would be on site at any given time, with a peak of 181 SFMTA staff from noon to 3 p.m. and 60 to 80 staff from 6 p.m. to 3 a.m.

Proposed Building Form and Design

The proposed new structure would occupy the site up to the property lines, except along the 17th Street frontage, due to the five-foot setback. The project includes a replacement transit facility at approximately 75 feet in height as measured to the top of the roof from grade at the midpoint of the property boundary

[30] Joint development floors within the replacement transit facility would include residential units on floors 2 through 6, with commercial uses and residential lobbies at the ground floor along Mariposa and Bryant streets, as currently shown on Figure 13 through Figure 18, pp. 27-29 and 31-33. Each of the floors would include a mix of the proposed joint development and transit facility uses.

[31] Current financial model assumes that residential units proposed for development within the replacement transit facility would be below market rate units while those developed atop the replacement transit facility would be a combination of market rate and below market rate units.

[32] The 180,000-square-foot Muni Metro East Light Rail Vehicle Facility is located along the Central Waterfront on Illinois and 25th streets in the Dogpatch/Bayview neighborhood, a block from the T Third Street Line. The 1399 Marin facility at Marin and Indiana streets, also located in the Dogpatch/Bayview neighborhood and in close proximity to the T Third Street Line, is currently used for receiving new transit vehicles and testing them before they are introduced into the overall transit fleet.

[33] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: 3-Level Bus Facility Design Criteria Document, June 2019, Section 2.1 (Staff Summary), p. 11.

along each elevation. The three- to seven-story residential structures atop the replacement transit facility would be approximately 30 to 70 feet tall as measured to the top of the roof (exclusive of any mechanical penthouses that could range from 16 to 20 feet and would be centrally located on rooftops). The tallest portion of the new structure would be located away from the 17th Street property line, toward the southern portion of the site. Thus, the proposed overall heights would range from approximately 75 feet for the replacement transit facility to a maximum of up to 150 feet, inclusive of the approximately 75-foot-tall replacement transit facility. The proposed structure, including balconies, terraces, and other features, as well as any rooftop additions or elements that feature unbroken glazed segments, would be designed to be compliant with the bird-safe features described in San Francisco Planning Code (planning code) section 139, as applicable.

The proposed upper-floor setbacks above the replacement transit facility show residential structures set back approximately 70 feet from the north property line (17th Street), approximately 20 to 30 feet from the east property line (Hampshire Street), approximately 15 to 25 feet from the south property line (Mariposa Street), and approximately 10 to 30 feet from the west property line (Bryant Street).[34] (See **Figure 4: Proposed Massing – South (Mariposa Street) Elevation, Figure 5: Proposed Massing – West (Bryant Street) Elevation, Figure 6: Proposed Massing – North (17th Street) Elevation**, and **Figure 7: Proposed Massing – East (Hampshire Street) Elevation**.)

Visual simulations of the proposed project from various publicly accessible viewpoints along the perimeter of the project site are shown on **Figure 8: Proposed View Looking South From Franklin Square**; **Figure 9: Proposed View Looking North Along York Street**; **Figure 10: Proposed View Looking West Along Mariposa Street**; and **Figure 11: Proposed View Looking North From Bernal Heights**.

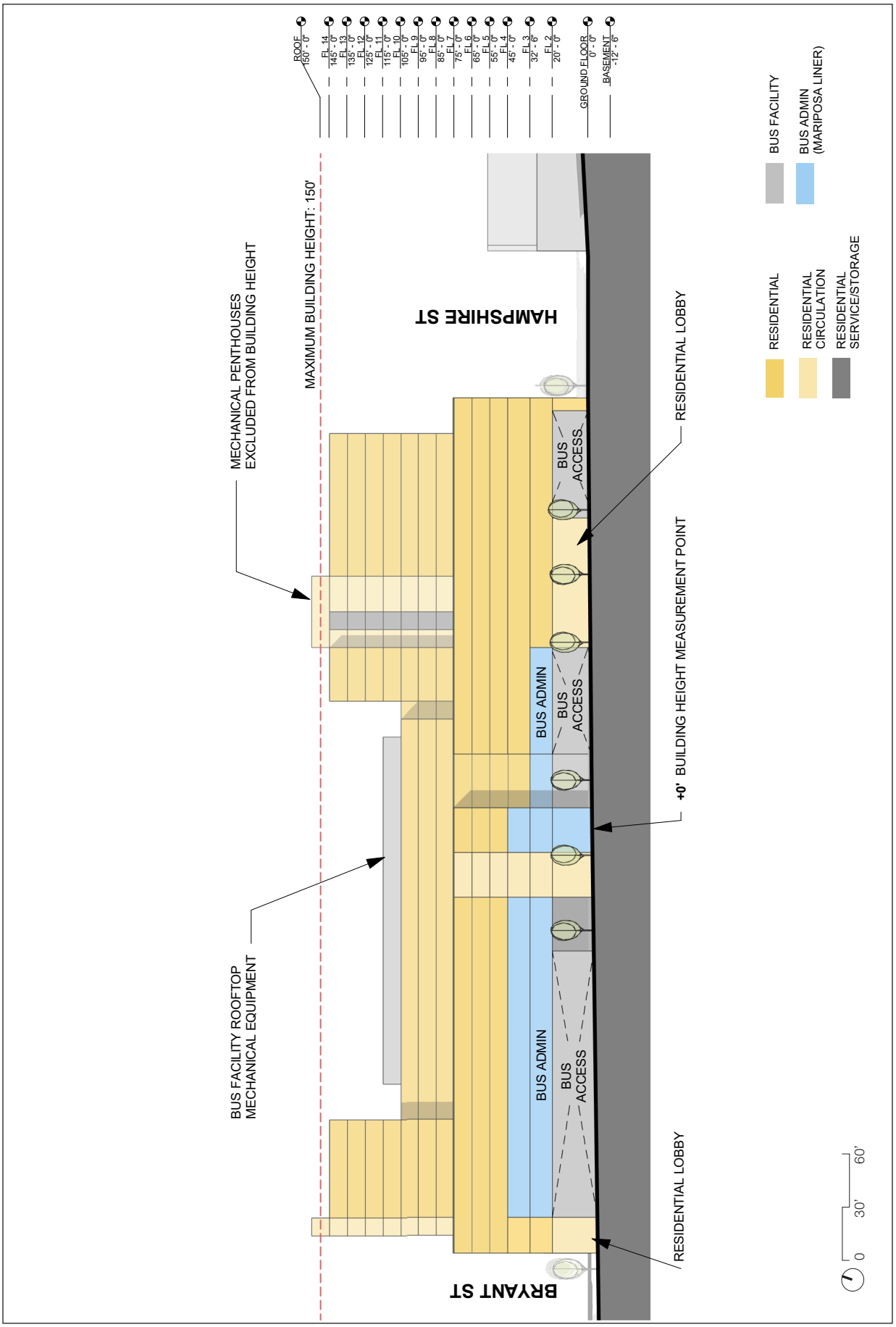
The proposed uses are described below by level and floor and illustrated in **Figure 12** through **Figure 19**.

Proposed Basement Level

The below-grade basement level would provide space for service functions for both the SFMTA and the joint development uses. The basement-level space for the SFMTA would include a loading dock; parts staging/storage area; battery electric storage, and work areas. Joint development space at the basement level would include a loading dock, storage, and service/delivery space. Other basement-level space would include stairways, elevators, class 1 bicycle parking, and trash, recycling, and composting.[35] (See **Figure 12: Proposed Basement Level Plan**.) In addition to these uses at the basement level, the proposed project could occupy the site's full dimensions to accommodate additional battery electric storage and infrastructure space for future expansion.

[34] Conceptual designs take advantage of the site's slope to limit shadows on Franklin Square.

[35] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-101 (Basement Overall Plan) to A-101I (Basement - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 10, November 20, 2019.



Source: Sitelab Urban Studio, 2019

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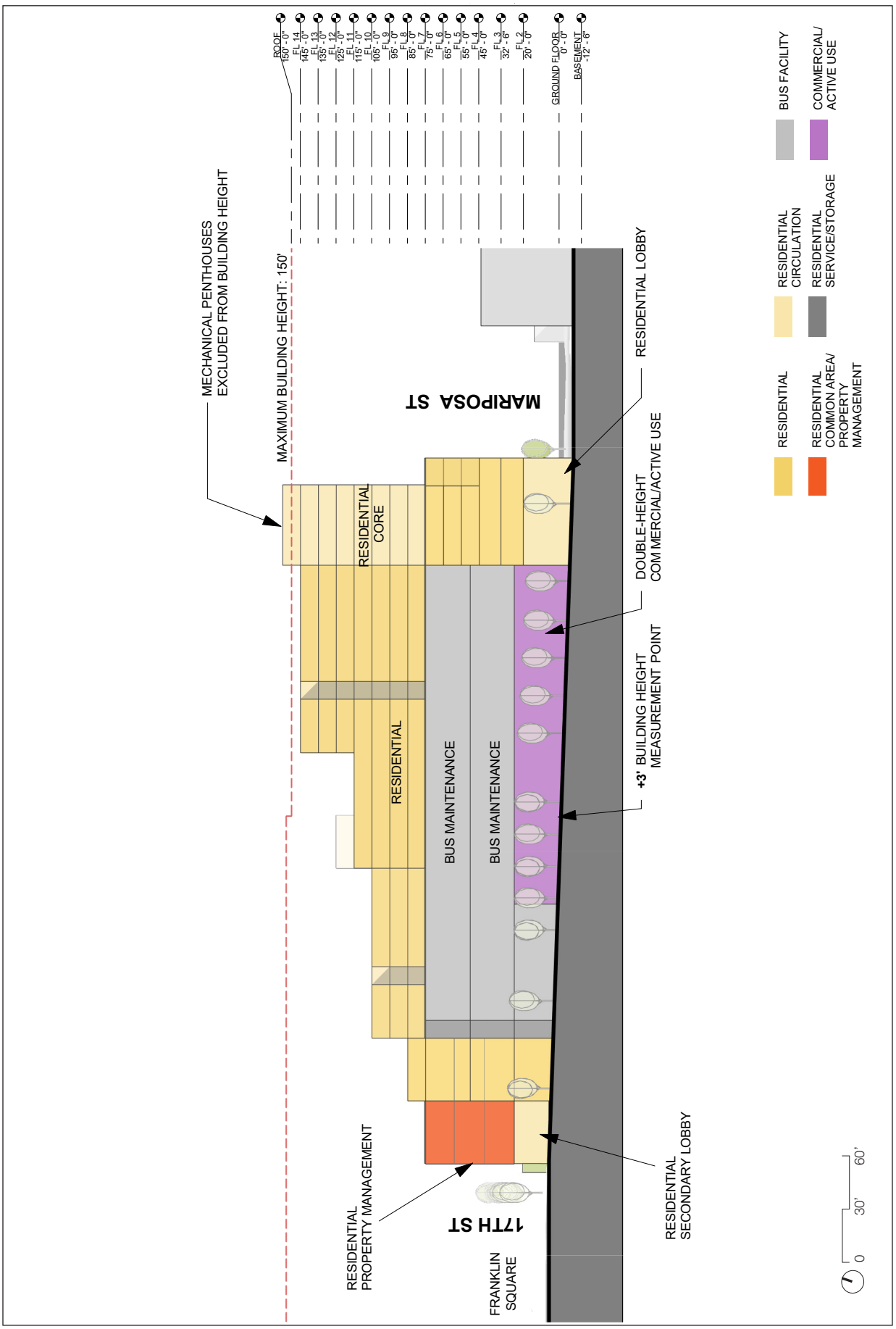
FIGURE 4: PROPOSED MASSING - SOUTH (MARIPOSA STREET) ELEVATION



Source: Sitelab Urban Studio, 2019

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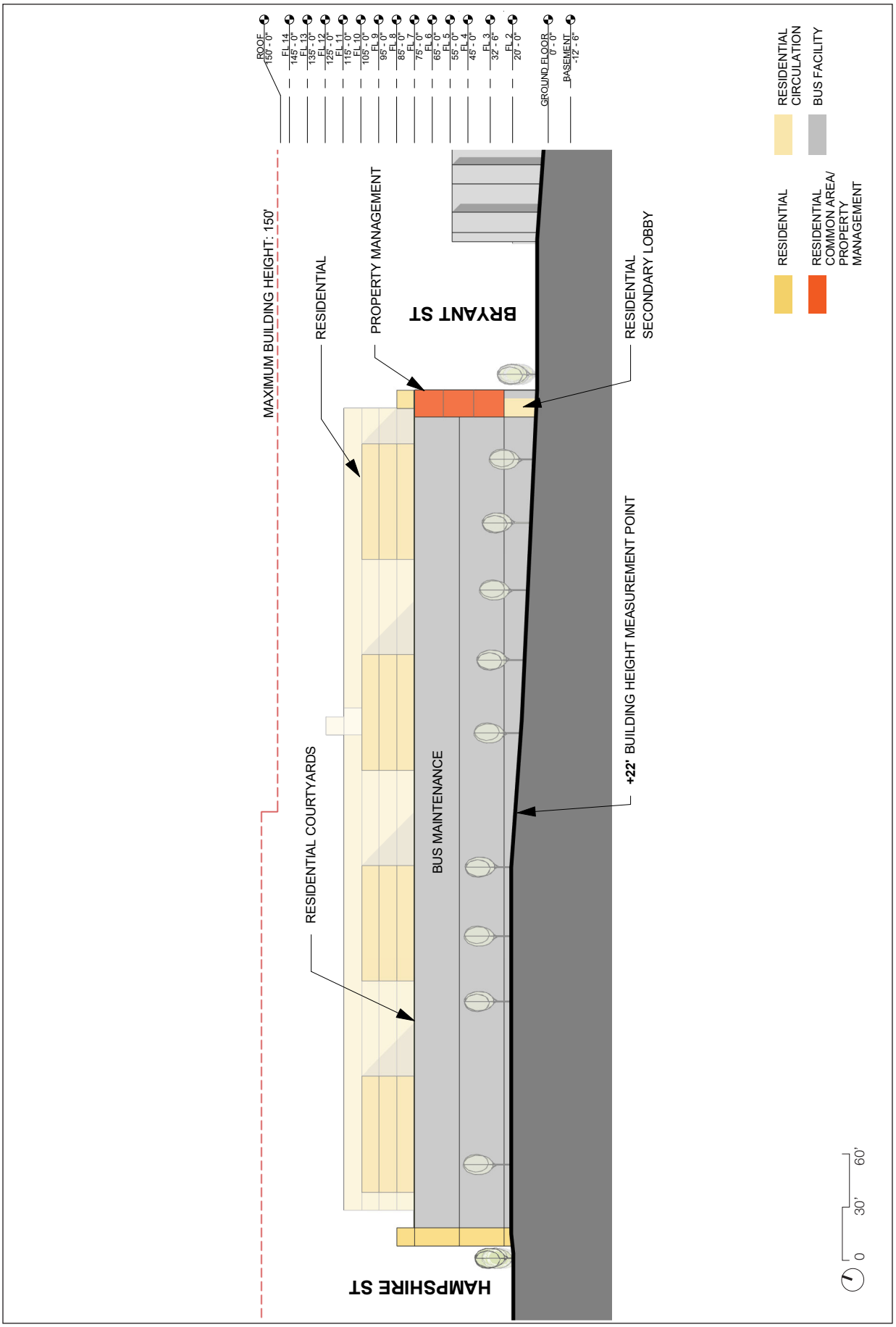
FIGURE 5: PROPOSED MASSING - WEST (BRYANT STREET) ELEVATION



Source: Sitelab Urban Studio, 2019

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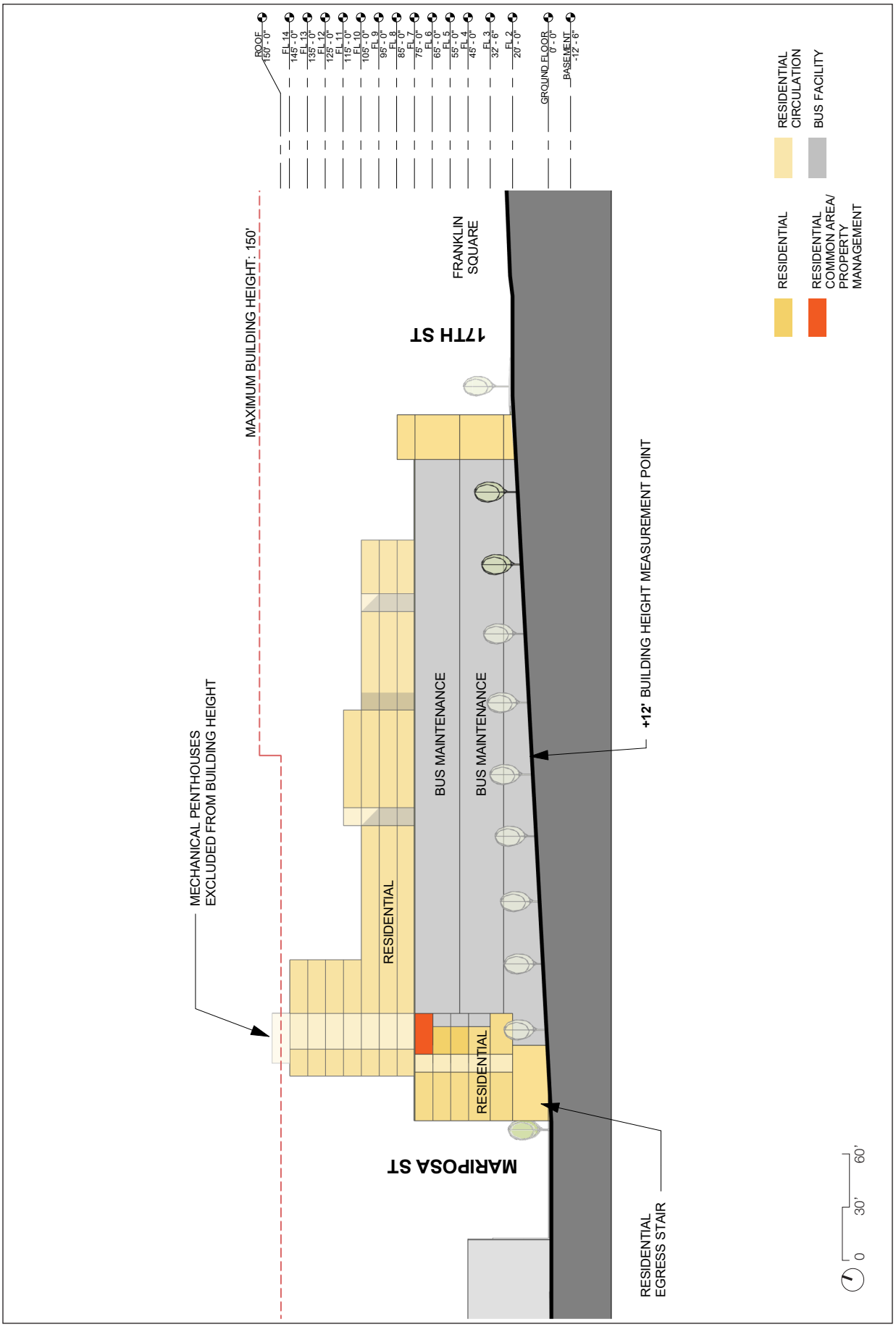
FIGURE 6: PROPOSED MASSING - NORTH (17TH STREET) ELEVATION



Source: Sitelab Urban Studio, 2019

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FIGURE 7: PROPOSED MASSING - EAST (HAMPSHIRE STREET) ELEVATION

Source: Prevision Design March 2020

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FIGURE 8: PROPOSED VIEW LOOKING SOUTH FROM FRANKLIN SQUARE

Source: Prevision Design March 2020

POTRERO YARD MODERNIZATION PROJECT

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FIGURE 9: PROPOSED VIEW LOOKING NORTH ALONG YORK STREET

Source: Prevision Design March 2020

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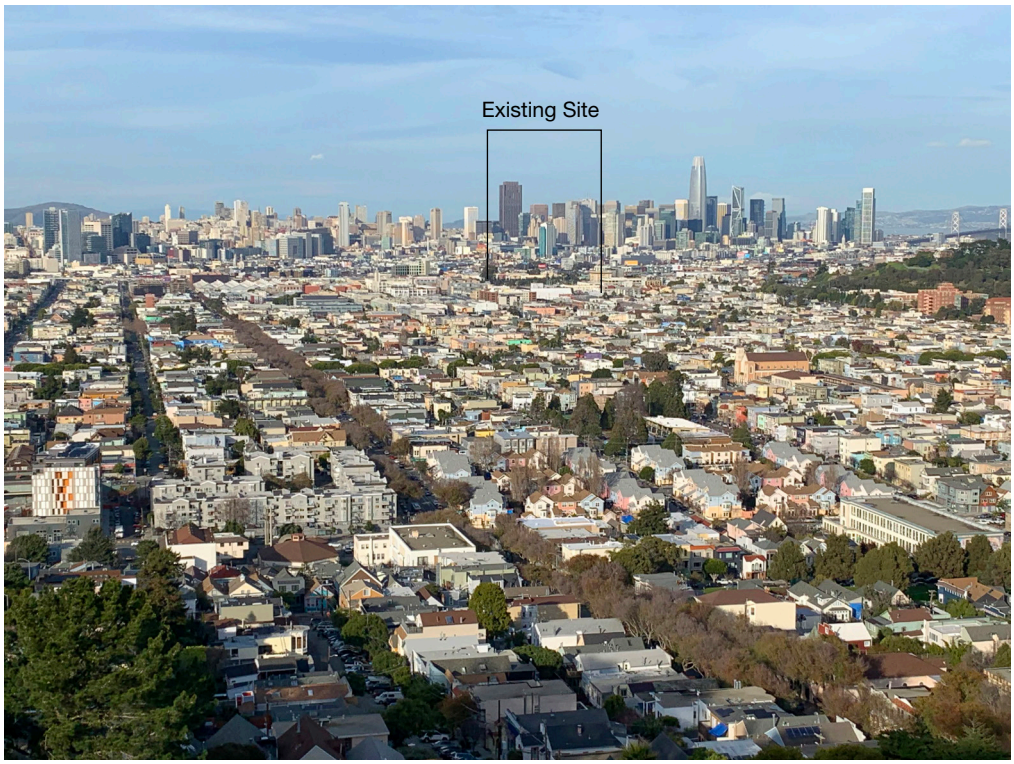
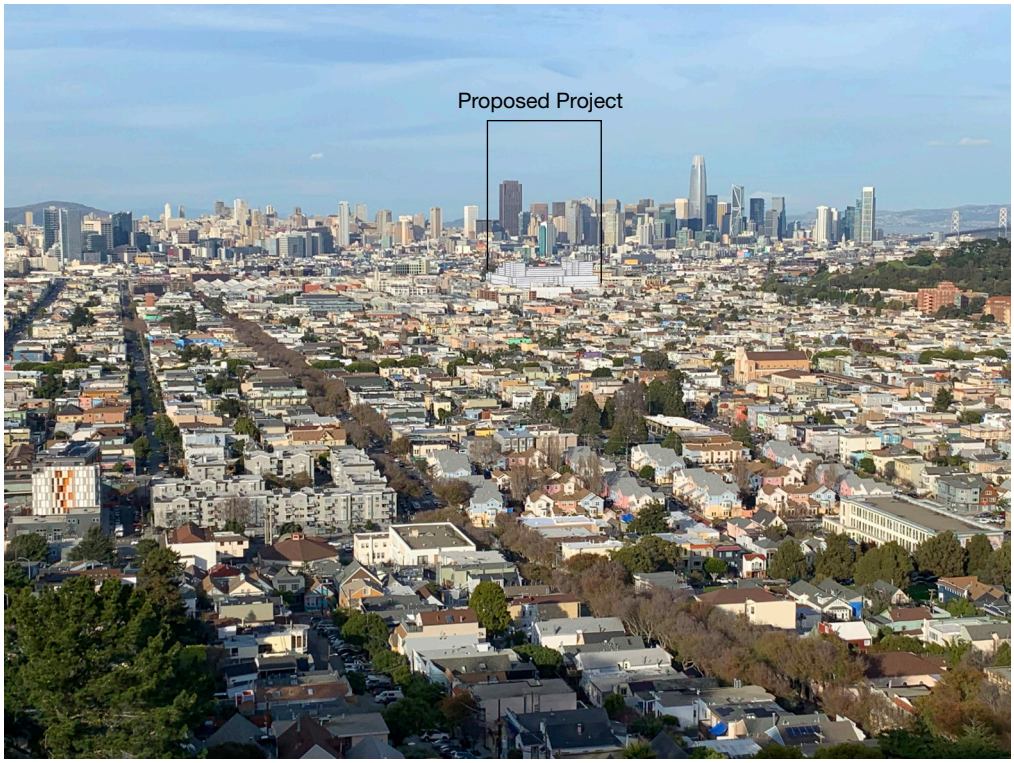
FIGURE 10: PROPOSED VIEW LOOKING WEST ALONG MARIPOSA STREET





Source: Prevision Design March 2020

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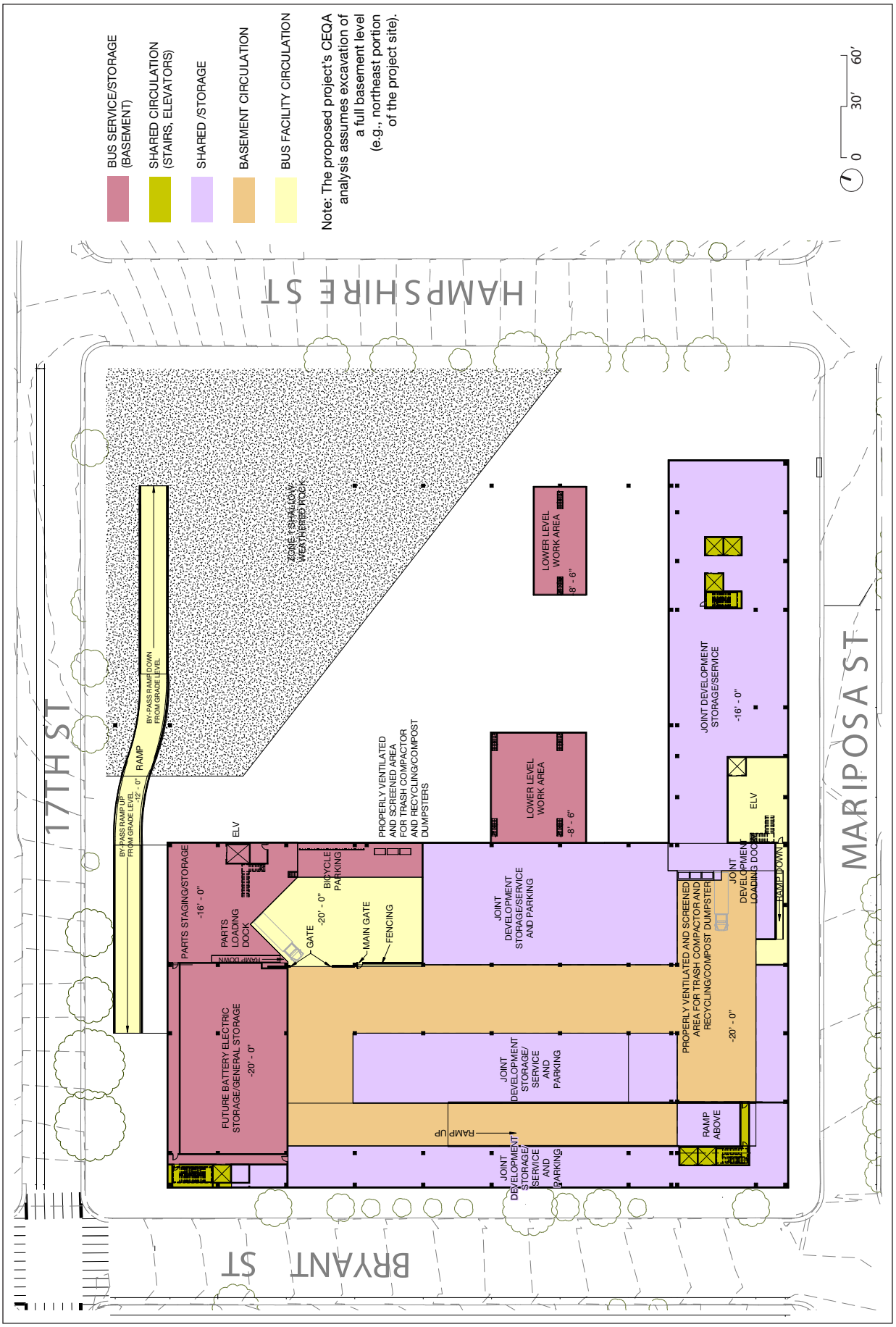
FIGURE 11: PROPOSED VIEW LOOKING NORTH FROM BERNAL HEIGHTS



Source: HDR/Stelab Urban Studio, 2019

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FIGURE 12: PROPOSED BASEMENT LEVEL

Proposed Transit Level 1 (Joint Development First Floor)

Transit Level 1 (or the ground level) would include heavy and running repair bays and would serve as a drive-through bus maintenance operation level. It would be below grade along 17th Street and at grade along Mariposa Street (see **Figure 13: Proposed Transit Level 1/Joint Development Floor 1**). The ground level would have stacked parking/storage for 40- and 60-foot-long buses, with a maximum capacity of 38 spaces for 40-foot-long buses (fewer spaces if the buses are 60 feet long), and maintenance and support areas. Ramps and drive aisles would provide internal circulation.

Transit Level 1 may also provide support space and services for SFMTA transit operators, maintenance, and administrative staff, including parts storage, training, and storage.[36] Joint development space would be limited and may include ground-floor retail and residential lobbies.

Proposed Mezzanine Level (Joint Development Second Floor)

The mezzanine level would be developed along Mariposa and 17th streets (see **Figure 14: Proposed Mezzanine Level/Joint Development Floor 2**). The mezzanine level may include a bus operations office and support areas with some square footage assigned to joint development space.[37]

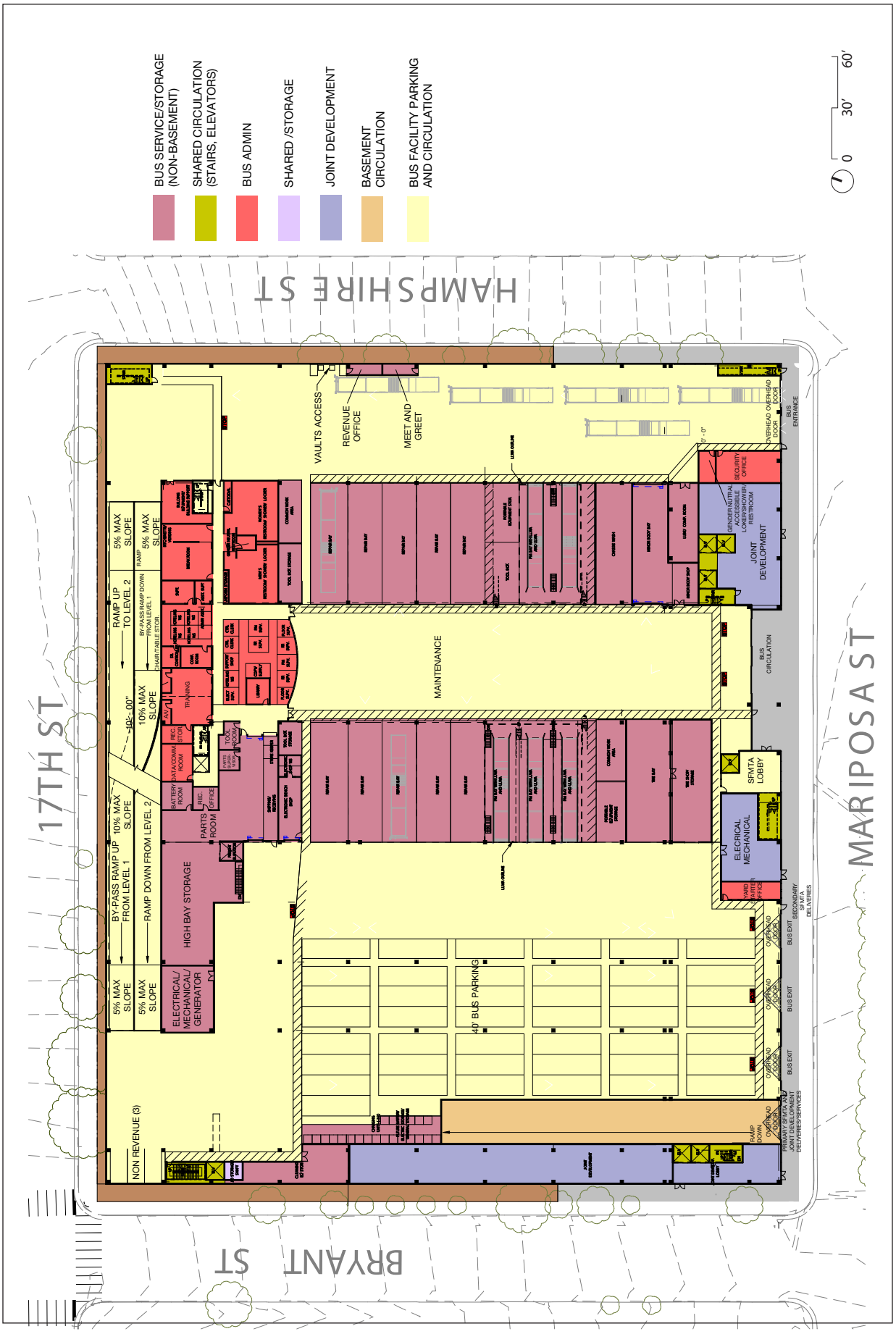
Proposed Transit Level 2 (Joint Development Third Floor)

Transit Level 2 would be at grade along 17th Street and would include ramps along the north property line (see **Figure 15: Proposed Transit Level 2/Joint Development Floor 3**). This level would provide drive aisles for circulation, stacked bus parking for 40- and 60-foot-long buses (90 spaces for 60-foot-long buses, more spaces if the buses are 40 feet long), a bus wash bay with a dedicated water reclamation equipment area, and electric charging infrastructure. A proposed emergency bus exit at the corner of 17th and Hampshire streets would provide access to 17th Street and replace the existing 52-foot-wide curb cut and driveway with a 42-foot-wide curb cut and driveway. Approximately 24 parking spaces and five electric vehicle charging stations would be dedicated for standard non-revenue vehicles. This level may also include SFMTA operations offices, conference rooms, training rooms, break rooms, restrooms, and lockers.[38] There is also potential for joint development space on Transit Level 2.

[36] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-102 (1st Floor Overall Plan) to A-102I (1st Floor - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 11, November 20, 2019.

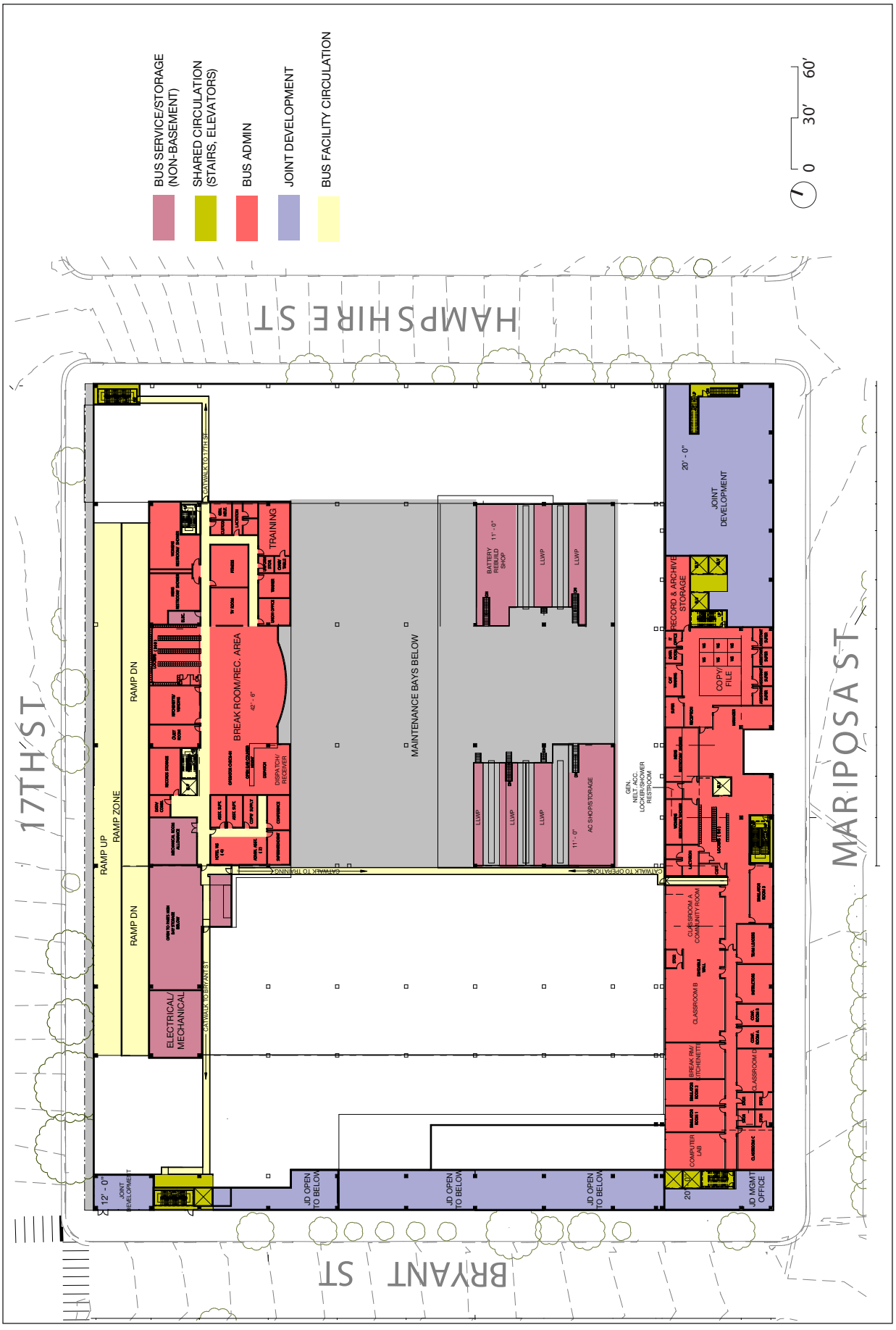
[37] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-103 (Training and Operations – 2nd Floor – Overall Plan) to A-103I (2nd Floor - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 12, November 20, 2019.

[38] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-104 (Bus Level 2 – 3rd Floor – Overall Plan) to A-104I (3rd Floor - Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 13, November 20, 2019.



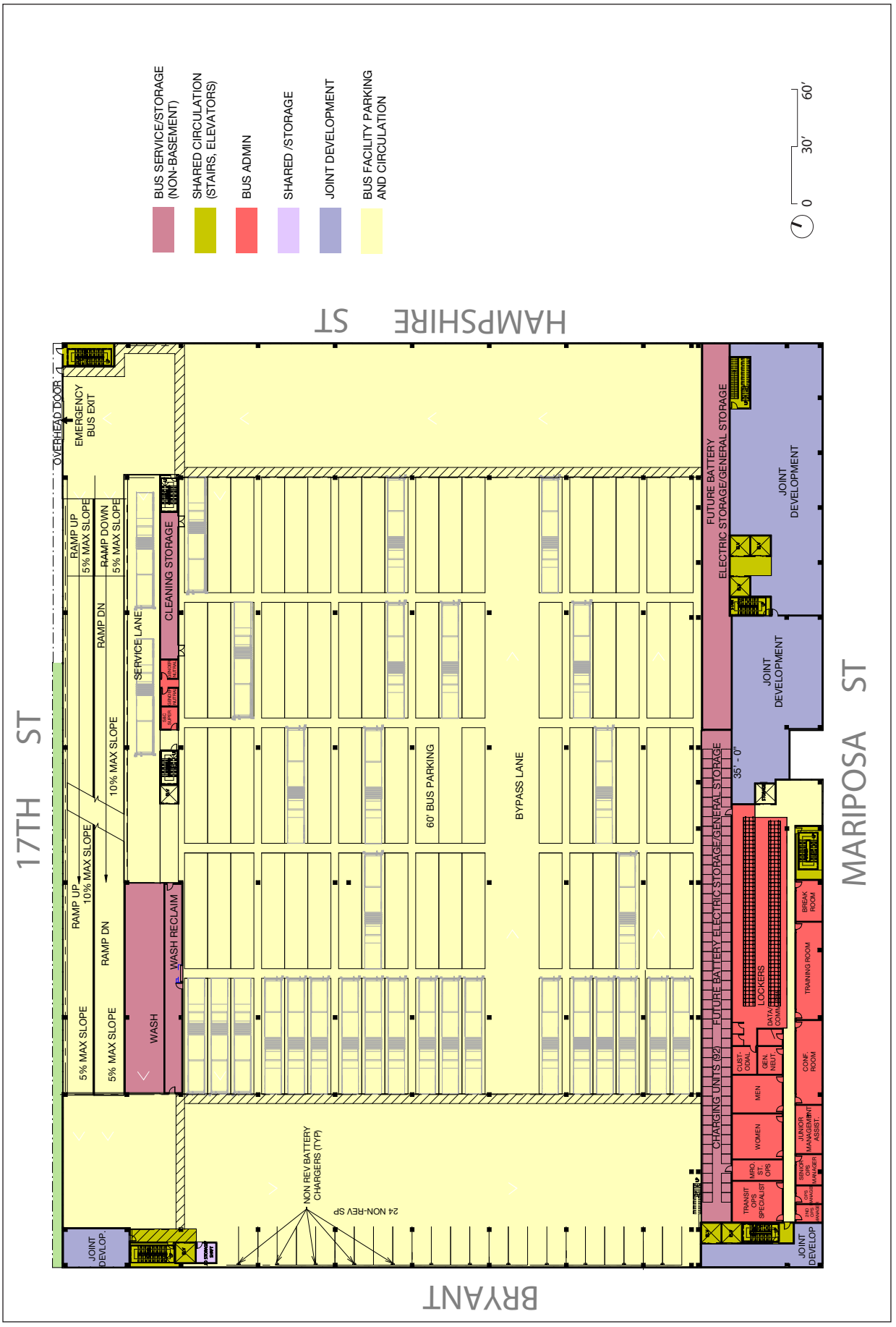
Source: HDR/Sitelab Urban Studio, 2019

FIGURE 13: PROPOSED TRANSIT LEVEL 1/ JOINT DEVELOPMENT FLOOR 1



Source: HDR/Sitelab Urban Studio, 2019

FIGURE 14: PROPOSED MEZZANINE LEVEL/ JOINT DEVELOPMENT FLOOR 2



Source: HDR/Sitelab Urban Studio, 2019

FIGURE 15: PROPOSED TRANSIT LEVEL 2/ JOINT DEVELOPMENT FLOOR 3

Proposed Transit Level 3 (Joint Development Fourth and Fifth Floors)

Transit Level 3 would provide drive aisles and stacked bus coach parking for 40- and 60-foot-long buses (85 spaces for 60-foot-long buses, more spaces if the buses are 40 feet long) with dedicated zones for electric charging infrastructure (see **Figure 16: Proposed Transit Level 3/Joint Development Floor 4**). Ramps are proposed along the north property line. Approximately 70 parking spaces and five electric vehicle charging stations would be dedicated for large and standard non-revenue vehicles. This level may also provide a bus wash bay with a dedicated water reclamation equipment area; a transit operations, equipment storage, and component rebuild assembly room; and associated storage, support and supervisory areas.[39]

Transit Level 3 would also encompass the fourth and fifth joint development floors, with potential for residential units and circulation space along Mariposa Street (see **Figure 16** and **Figure 17: Proposed Joint Development Floor 5**).

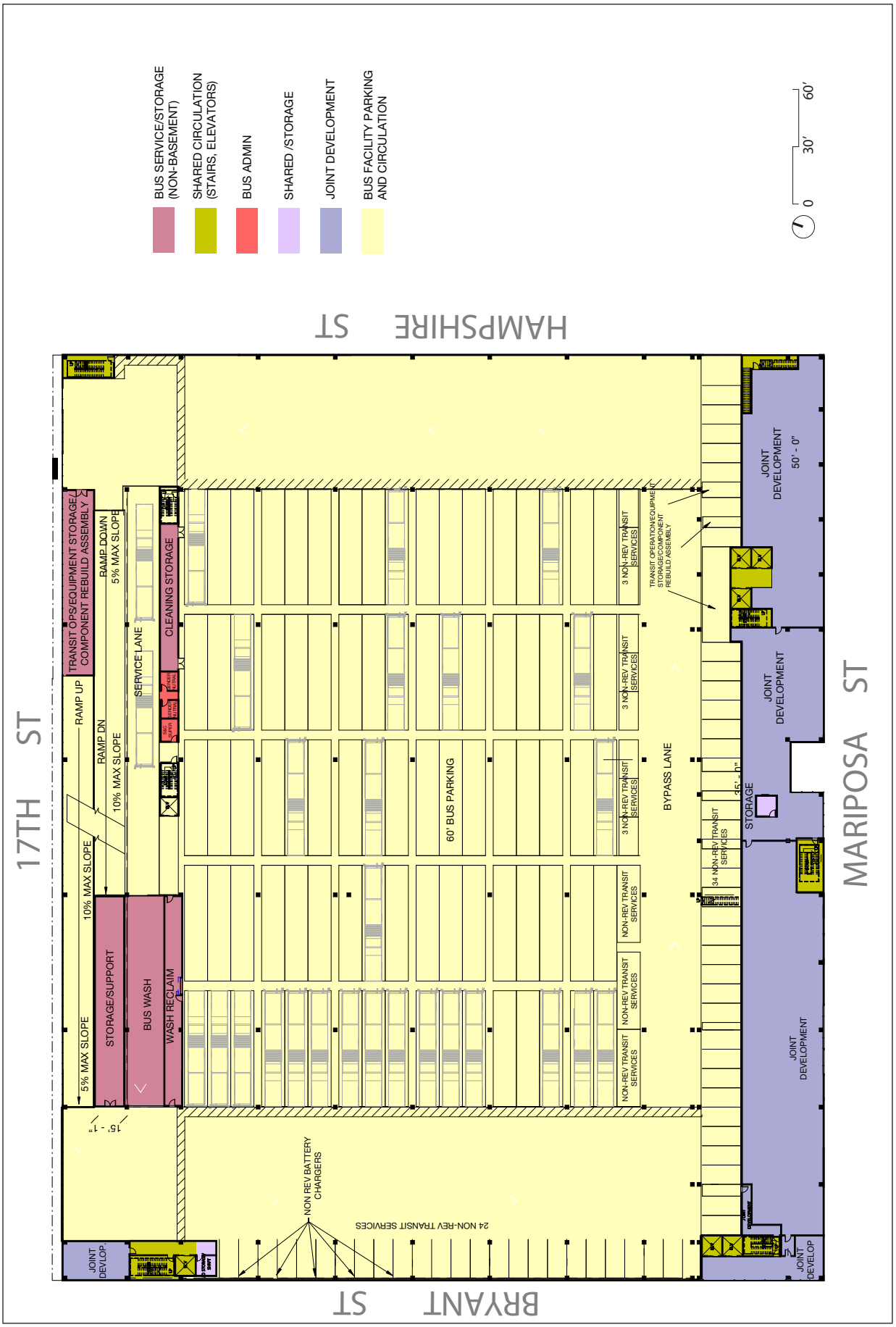
Proposed Joint Development Sixth Floor

The sixth joint development floor would include residential units and circulation space, and may include a residential common area and property management office along Mariposa Street (see **Figure 18: Proposed Joint Development Floor 6**).[40]

Proposed Joint Development Seventh to Thirteenth Floors

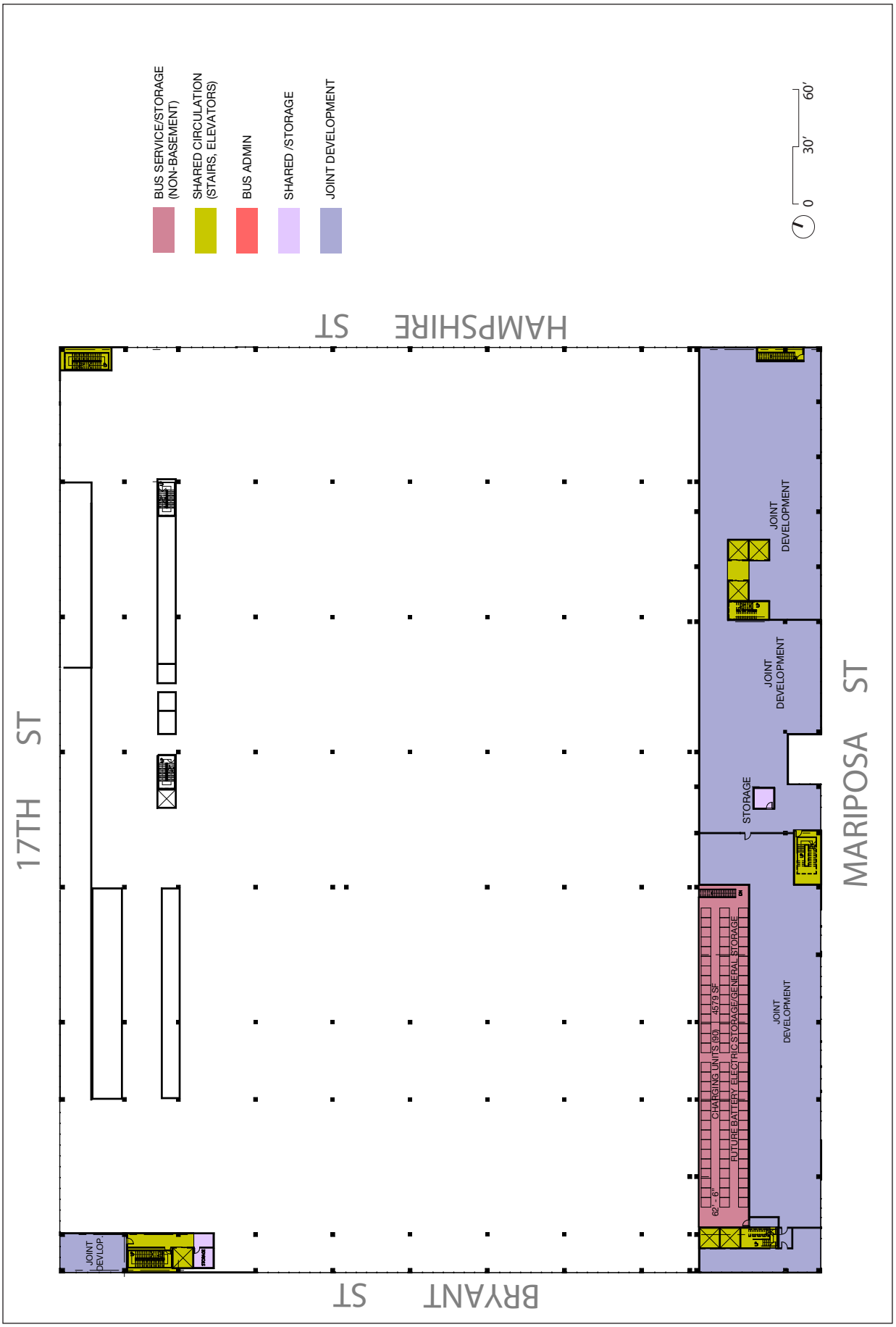
The joint development above the replacement transit facility would include residential units and circulation space (see **Figure 19: Proposed Joint Development Floors 7-13**). Residential structures would rise from three to seven stories above the replacement transit facility.[41] Up to 91,000 square feet of residential common open space could be developed on top of the replacement transit facility.

[39] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheets A-105 (Bus Level 3 – 4th Floor – Overall Plan) to A-105I (4th Floor - Area I) and Sheets A-106 (5th Floor – Overall Plan) to A-106I (5th Floor – Area I), February 20, 2019, and Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 14, November 20, 2019.
[40] Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 08, November 20, 2019.
[41] Sitelab Urban Studio, Potrero Yard Planning Application, Sheet 09, November 20, 2019.



Source: HDR/Sitelab Urban Studio, 2019

FIGURE 16: PROPOSED TRANSIT LEVEL 3/ JOINT DEVELOPMENT FLOOR 4

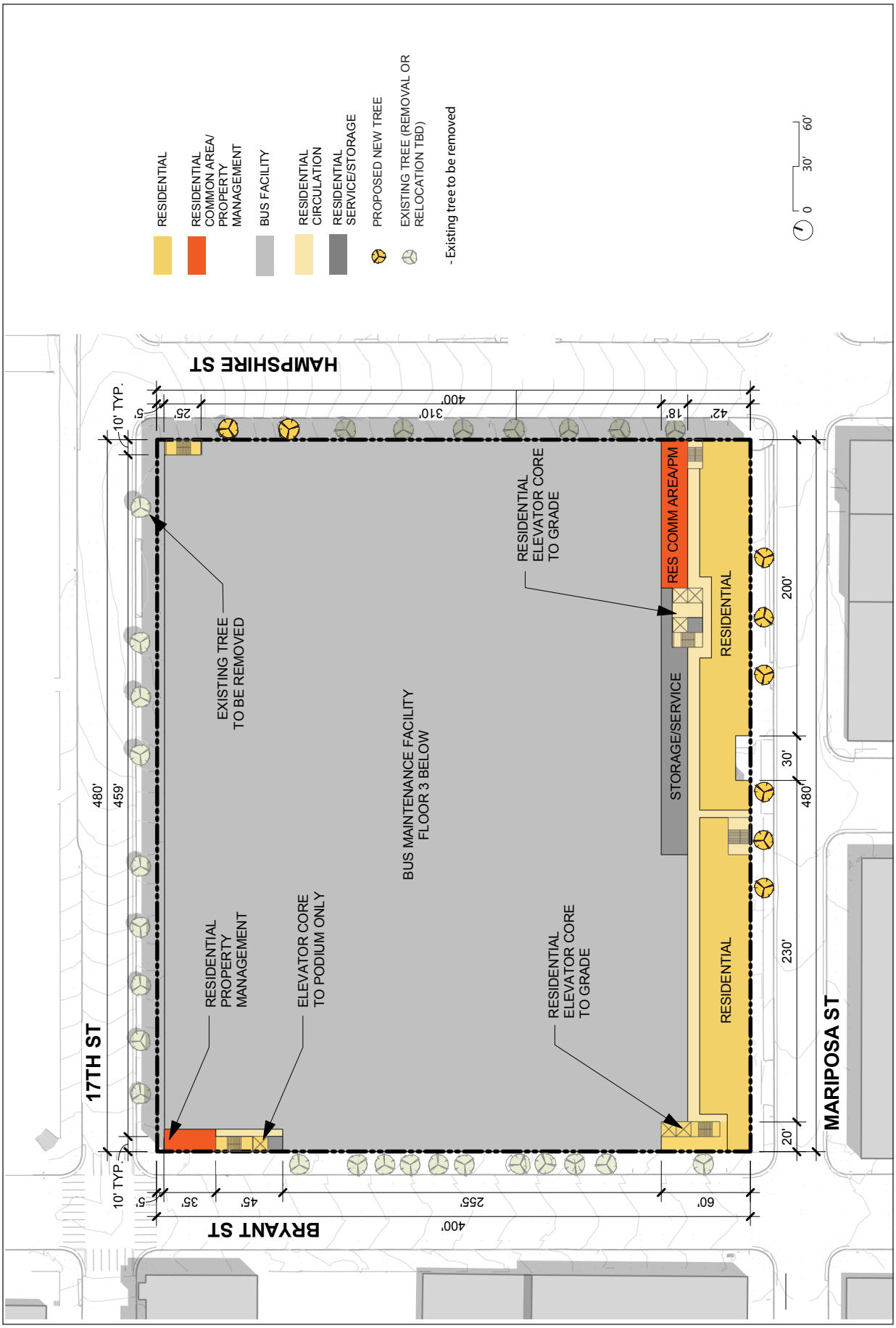


Source: HDR/Sitelab Urban Studio, 2019

FIGURE 17: PROPOSED JOINT DEVELOPMENT FLOOR 5

POTRERO YARD MODERNIZATION PROJECT

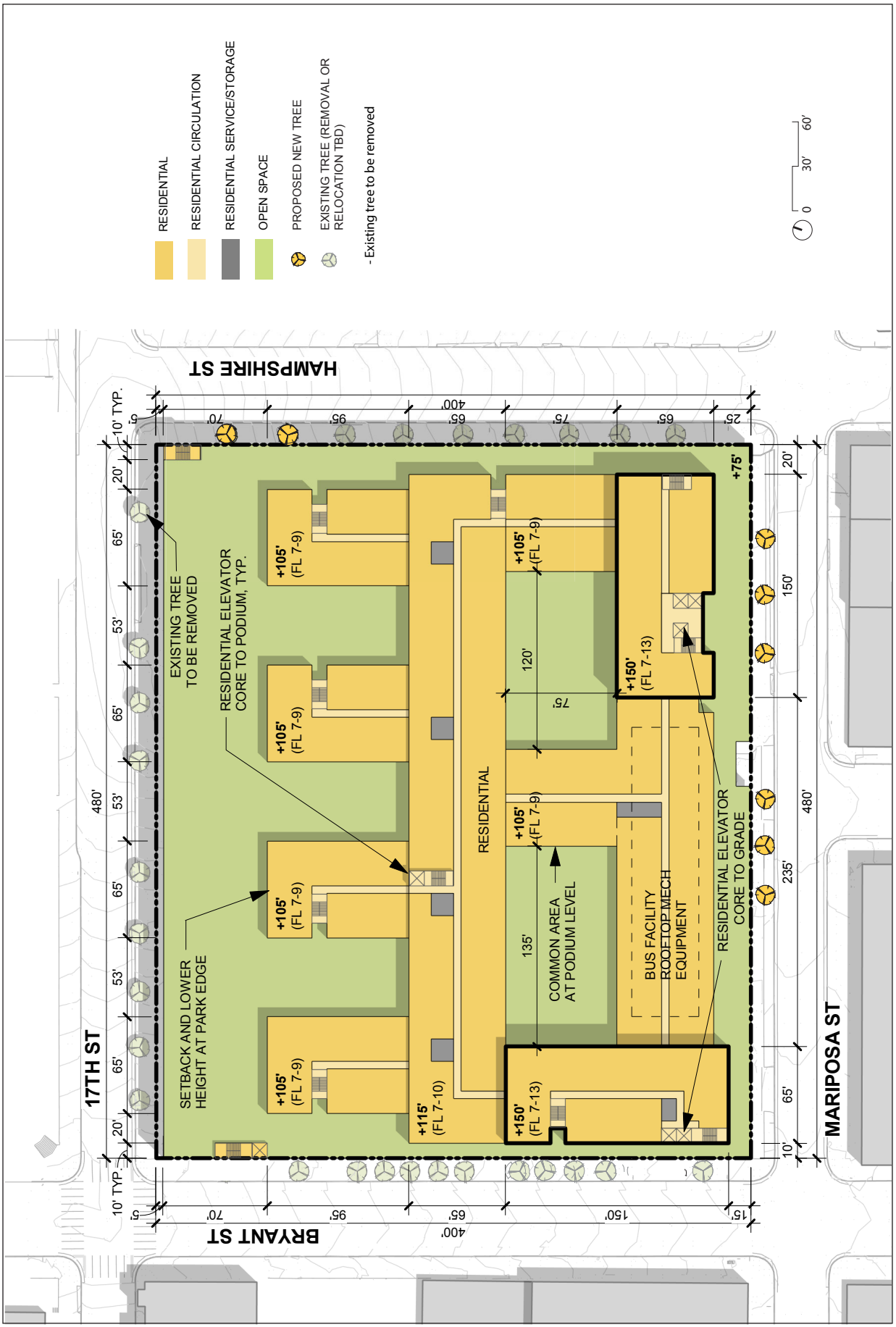
2019-021884ENV



Source: Sitelab Urban Studio, 2019

POTRERO YARD MODERNIZATION PROJECT
2019-021884ENV

FIGURE 18: PROPOSED JOINT DEVELOPMENT FLOOR 6



Source: Sitelab Urban Studio, 2019

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 19: PROPOSED JOINT DEVELOPMENT FLOORS 7-13

Proposed Changes in Street Rights-of-Way

The proposed project includes changes within the Mariposa Street, 17th Street, Bryant Street, and Hampshire Street rights-of-way (see **Figure 3**, p. 12). To the extent feasible, all proposed changes would conform to the guidelines in the Better Streets Plan and the Mission District Streetscape Plan[42] as well as the requirements of the SFMTA, the San Francisco Public Utilities Commission, and the Bureau of Urban Forestry. Many of these changes would require further engineering, public input, and review to confirm feasibility and desirability.

The project proposes to retain existing mature street trees along 17th and Hampshire streets, plant new street trees, install street lighting, install pedestrian bulbouts and pedestrian ramps, attach overhead catenary system cables to the proposed building, and remove catenary poles from the sidewalk. The proposed project would also move overhead utilities underground if and where it is feasible.

Pedestrian Network

The existing bus storage yard (south fence) encroaches on the Mariposa Street sidewalk, narrowing the existing sidewalk width along the western half of the Mariposa site frontage to 7 feet. The footprint of the replacement transit facility would be moved back to the property line, which would enable the project to effectively widen the Mariposa Street sidewalk to at least 12 feet. The proposed project would maintain all other sidewalks at 15 feet wide.

The proposed project would also construct the following pedestrian network improvements, including all necessary striping and lighting, pending further feasibility analysis:

- bulbouts at the northeast corner of Bryant and Mariposa streets projecting into both Bryant and Mariposa streets
- bulbout at the northwest corner of Hampshire and Mariposa streets projecting into Hampshire Street
- curb ramps for pedestrian crossings adjacent to the project site and a curb ramp on the southeastern side of the Mariposa/York street intersection facing Mariposa Street
- continental style crosswalks at all approaches at the intersections of Hampshire/17th streets, Hampshire/Mariposa streets, and Mariposa/York streets
- a raised crosswalk and a rectangular rapid flash beacon for the pedestrian crossing of 17th Street at Hampshire Street

Bicycle Network

The project would convert the existing striped and partially protected bicycle lanes into green protected, widened bikeways in both directions on the segment of 17th Street between Bryant and Hampshire streets. This change would require the elimination of parallel parking on the north side of 17th Street. If not feasible,

[42] San Francisco Planning Department, Mission District Streetscape Plan, available at https://archives.sfplanning.org/CDG/CDG_mission_streetscape.htm, accessed July 10, 2020.

the SFMTA would raise the bike lane on the south side to sidewalk level, apply green paint, and install "safe hit posts".

Bus Stops

The proposed project would not change existing bus operations in the vicinity of the project site, i.e., remove or relocate bus stops. The northbound and southbound Muni bus stops on the southeast (adjacent to the project site) and southwest corners of Bryant and 17th streets would remain. The existing northbound and southbound Muni bus stops on the southeast and northwest corners of Bryant and Mariposa streets, respectively, would potentially include new shelters, transit notification systems, and additional street lighting, as necessary.

Parking and Loading

The proposed project would maintain perpendicular on-street parking on the west side of Hampshire Street adjacent to the project site but would eliminate several spaces to accommodate a pedestrian bulbout and accompanying passenger loading zone at Mariposa Street. Parking on the east side (across from the project site) would be converted to parallel parking, eliminating several spaces. Parking would also be eliminated and prohibited on the east and west sides of Hampshire Street within 10 feet of the intersection of 17th and Hampshire streets. Other changes include the following:

- eliminating parallel parking on the north side of 17th Street between Bryant and Hampshire streets starting approximately 230 feet east of the intersection of Bryant and 17th streets to gain more width for protected bike lanes
- removing parking spaces along the north side of Mariposa Street and restriping as a no parking zone
- installing audible and/or visual warning systems to alert pedestrians and/or bicyclists as buses, non-revenue vehicles, and other SFMTA vehicles exit onto Mariposa and 17th streets

The primary loading areas for the SFMTA and for the proposed residential use would be located in the proposed basement level, accessed via a 20-foot-wide ramp on Mariposa Street east of Bryant Street. A secondary off-street loading area for the SFMTA would be located on the ground floor. In addition, limited curb areas would be restriped for passenger and commercial loading, with two accessible 60-foot-long passenger loading zones proposed along Bryant and Hampshire streets, immediately north of Mariposa Street; and a 40-foot-long commercial loading zone proposed along Bryant Street, immediately north of the proposed passenger loading zone (see **Figure 3**, p. 12).

Access and Site Circulation

Primary vehicular access to and from the site would be from Mariposa Street (see **Figure 3**, p. 12):

- The four bus entry bays between York and Hampshire streets would be accessed via two separate curb cuts, an approximately 47-foot-wide curb cut near Hampshire Street and an approximately 63-foot-wide curb cut near York Street.
- The three bus exit bays between Bryant and York streets would be exited via an approximately 97-foot-wide curb cut.
- The existing 30-foot-wide curb cut on Mariposa Street (near Bryant Street) would be reduced to an approximately 20-foot-wide curb cut that would accommodate loading and delivery and other joint development and transit facility space needs.

The existing 52-foot-wide curb cut and driveway on 17th Street would be relocated east closer to Hampshire Street and reduced in width to 42 feet. It would function as an emergency exit for buses and non-revenue vehicles.

Work bays on Transit Level 1 would be accessed via drive aisles associated with the two westernmost entry bays from Mariposa Street. Buses and non-revenue vehicles would use the ramps at the north side of the building to access work bays and parking spaces on Transit Levels 2 and 3 as well as parking spaces on Transit Level 1 via an at-grade level bypass ramp (see **Figure 12** and **Figure 13**, pp. 25 and 27). The ramps and drive aisles would route all buses and non-revenue vehicles south toward the Mariposa Street exits.

The proposed basement level would accommodate building services and battery electric infrastructure for the SFMTA and the joint development components providing tenant storage; dumpsters for refuse, recycling, and compost; parking for bicycles (class 1) and car-share vehicles (12); and two loading docks. Internal circulation on this level would accommodate service delivery vehicles for the proposed transit, residential, and commercial uses and for refuse collection.

SFMTA staff would access the replacement transit facility through a ground-floor lobby on Mariposa Street. The residential component of the proposed project along the southern and western perimeter of the replacement transit facility, as well as the residential development atop the replacement transit facility, would be accessed through ground-floor lobbies, shown on Mariposa and Bryant streets (see **Figure 13** and **Figure 14**, pp. 27 and 28). Shared elevators and stairs would be located at the northwest, southwest, and southeast corners of the proposed building.[43]

[43] HDR, SFMTA Potrero Scenario 2 (3-Level), Sheet A-102 (1st Floor Overall Plan), June 14, 2019.

Proposed Landscaping and Open Space

Landscaping

The proposed project would include a 5-foot-wide planting strip along the length of the 17th Street frontage (up to 2,140 square feet). No additional at-grade landscaping is proposed as part of the project; however, common open space serving the residents (and possibly SFMTA employees) could be developed on top of the replacement transit facility.

Construction of the proposed project would require the removal, retention, and/or replacement of the 27 existing street trees along 17th, Bryant, and Hampshire streets. The project sponsor would plant new street trees on the adjacent sidewalks, including new trees to replace any removed, in compliance with the planning code, the public works code, and the Better Streets Plan.[44] Specific streetscape changes related to the retention and planting of existing and new street trees would include the following:

- On 17th Street, the existing mature trees would be retained, except for those that would conflict with the proposed location for the emergency bus exit, and new street trees would be planted.
- On Bryant and Hampshire streets, trees located in the middle of the sidewalk may be replaced with new street trees.
- On Mariposa Street, approximately six trees are proposed in locations that would not conflict with bus driveways.

Open Space

Common and private open space is proposed for the residential uses in accordance with the requirements set forth in section 135 of the planning code. Up to 91,000 square feet of common open spaces is proposed as part of the project. During review of the proposed project's detailed design, the SFMTA would determine the feasibility of designating onsite open space for SFMTA staff and/or public use. The overall final design and allocation of common open space for the proposed project may be modified throughout the planning entitlement process.

Proposed Stormwater Management

The project site is served by the San Francisco Public Utilities Commission's combined sewer system, and the entire site is covered with impervious surfaces. Implementation of the proposed project would disturb more than 5,000 square feet of impervious ground surface. Thus, the City's Stormwater Management Requirements and Design Guidelines are applicable and Preliminary and Final Stormwater Control Plans will be submitted to the San Francisco Public Utilities Commission for review.[45] The proposed project would cover the entire lot (except for a 5-foot-wide landscaping strip along 17th Street) and would

[44] See planning code sections 138.1 and 428 and public works code sections 805(a) and 806(d) for specific requirements related to tree planting and allowable waivers due to site constraints.
[45] San Francisco Public Utilities Commission, https://sfwater.org/index.aspx?page=1006, accessed July 24, 2020.

incorporate best management practices to ensure proper onsite retention and management of stormwater to meet the requirements of the stormwater management ordinance. The project's detailed final design will address these requirements and incorporate measures to reduce the stormwater runoff rate and volume, such as site-wide stormwater retention and rainwater capture and treatment systems, to provide a non-potable water supply for the replacement transit facility's bus wash bays, toilet and urinal flushing, and landscaping.

Proposed Sustainability Program

It is anticipated that the proposed building (including the transit facility and joint development components) would be designed to meet United States Green Building Council and Leadership in Energy and Environmental Design (LEED) requirements. The proposed sustainability strategies would comply with state, regional, and local green building requirements as set forth in the California Green Building Standards Code, the San Francisco Green Building Code, and chapter 7 of the environment code to obtain LEED Gold certification. The sustainable design building systems could include, but would not be limited to, development of electrical infrastructure capable of supplying electricity for electric vehicle charging of the fleet, and other strategies or mechanisms, such as daylight harvesting through the use of a network of occupancy and vacancy sensors[46]; the use of solar photovoltaic panels on rooftops to produce on-site power; green roofs to minimize heat island effects[47]; and use of Title 24-compliant components for plumbing and other building systems such as heating, ventilation, and air conditioning.[48]

Project Construction

Construction Duration

The SFMTA estimates that construction of the proposed project would take three to four years to complete, with construction beginning in 2023 and building occupancy by the end of 2026.[49]

The three- to four-year construction period would include some overlapping phases of demolition, excavation, foundation work, and building construction. Demolition would last approximately two months. Excavation, shoring, grading, and installation of piles for the foundation system would last approximately six months. Completion of the foundation system and basement construction would last approximately two months. Building construction would last approximately 26 months with paving and architectural coating estimated to take a total of two months.

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[46] A building control system that reduces demand for artificial light in building interiors when daylight is available thus reducing energy demand.

[47] The combined effect of heat generated from use of mechanical equipment and heat trapping/reflectivity characteristics of impermeable surfaces on rooftops and other land, such as paved roadways and parking lots, that increases ambient temperatures in urbanized areas and increases energy demand for building cooling.

[48] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: 3-Level Bus Facility Design Criteria Document, June 2019, Section 4.4 (Sustainability), Section 4.12 (Electrical), Section 5.3 (Exterior Enclosure), Section 5.8 (Plumbing), and Section 5.10 (HVAC), pp. 36-38, 46, 48-50, 71, 84, 88, 95, and 103-104.

[49] BASELINE Environmental Consulting, Air Quality and Health Risk Assessment Methodology, Appendix A, SFMTA and Public Works Construction Schedule and Equipment List, July 2020.

Construction-related activities would typically occur Monday through Saturday, between 7 a.m. and 8 p.m., with most work occurring between Monday through Friday. Nighttime construction is anticipated for certain activities such as major concrete pours; however, construction on Sundays and major legal holidays is not anticipated.

Construction Staging

Construction staging would occur on site and on the surrounding sidewalks. There would be no pedestrian access to the sidewalks surrounding the site for most or all the construction period. The existing bus stop at the southeast corner of Bryant and 17th streets would be relocated or removed. Hampshire Street between 17th and Mariposa streets would be partially closed on a temporary, as-needed basis to provide additional space for laydown and staging.

Demolition, Excavation, and Foundation

Site preparation would begin with demolition and clearing of the existing building, vehicle service pits, foundations, control booth, and paved areas on the east side of the project site. On the west side the paved areas of the bus storage yard, obsolete utilities, overhead catenary system support poles and cables, bus wash station infrastructure, surround retaining walls and fencing, and any other at-grade elements including the adjacent sidewalks would be demolished. All demolition debris would be removed from the site.

Construction of the proposed building would require excavation to a depth of approximately 35 feet below ground surface across the full site, with slightly greater excavation for vehicle maintenance pits (i.e., lower level work areas) and elevator pits. Assuming full demolition and excavation to a depth of 35 feet across the whole site, approximately 248,900 cubic yards of soils would need to be removed from the site. Dewatering and pre-treatment prior to release to the combined sewer system would be required given anticipated excavation depths beneath the groundwater table.[50]

Below-grade excavation would require the replacement of some or all the retaining walls along the north, east, and west sides of the site, and temporary shoring would be needed to support the planned cuts for the final basement configuration. The proposed foundation system would consist of a shallow foundation of spread footings at column locations or a structural mat slab bearing on bedrock along the northeast portion of the site with a deeper foundation bearing on pile groups to support development in other areas of the site.[51] The project would include a deep foundation system supported by driven steel H-piles; however, non-displacement auger cast in place piles are also identified as an option in the Geotechnical Report.

[50] ARUP/RYCG, SFMTA Potrero Yard Facility Rebuild Geotechnical Engineering Report, November 11, 2019, p. 22.
[51] ARUP/RYCG, SFMTA Potrero Yard Facility Rebuild Geotechnical Engineering Report, November 11, 2019, pp. 27-39.

Estimated Construction Costs

In July 2019, construction costs for the replacement transit facility and joint development (including the residential [market rate and below market rate] and commercial components) were estimated at approximately $495 million in 2019 dollars.

PROJECT VARIANTS

The SFMTA is considering four proposed variants. The first two variants are the same as the proposed project except for the specific variation described. The last two variants are also similar to the proposed project but would require site program revisions. Each of the variants will be described and analyzed in the EIR in more detail:

- **Emergency Exit Relocation Variant:** Relocation of the proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street.
- **Joint Development Lobby Variant:** Relocation of the joint development lobby off Mariposa Street to Hampshire Street.
- **Active 17th Street Variant:** Site program revision to include active uses along 17th Street frontage, including internal relocation of ramps from the north portion of the site to a more southerly location.
- **Employee and Family Support Variant:** Site program revision to include childcare, or related use, in the space identified in the proposed project for ground-floor commercial use.

ANTICIPATED PROJECT APPROVALS

Implementation of the proposed project or its variants would require changes to the existing development controls for the project site through planning code and zoning map amendments, including changes to accommodate the newly proposed mix of land uses and the proposed building's height/bulk. The following is a preliminary list of anticipated approval actions for the proposed project or its variants and is subject to change. These approvals may be considered by City decision-makers in conjunction with the required environmental review, but they may not be granted until the required environmental review has been completed.

Actions by the Planning Commission

- Certification of Environmental Impact Report (EIR) and adoption of findings under CEQA
- Adoption of Findings of Consistency with the general plan and priority policies of planning code section 101.1
- Recommendation to the Board of Supervisors to amend the general plan, including but not limited to the Mission Area Plan and the Urban Design Element
- Recommendation to the Board of Supervisors to amend the Planning Code and Zoning Maps by 1) establishing a Special Use District (SUD) to accommodate residential and commercial uses and to designate the boundaries of the SUD; (2) potentially changing the underlying zoning from P (Public) to a mixed-use designation; and (3) changing the height and bulk designation from 65-X

to a designation that accommodates and describes the proposed heights of the proposed project including allowing heights to a maximum 150 feet

- Approval either through a Conditional Use authorization under Planning Code section 303, Large Project authorization under Planning Code section 329, or something uniquely tailored to the proposed project to be further described in the SUD

Actions by the Board of Supervisors

- Adoption of findings under CEQA
- Adoption of Findings of Consistency with the general plan and priority policies of planning code section 101.1
- Approval of amendments to the general plan, planning code, and zoning map

Actions by Other City Departments

- San Francisco Public Works
  - Actions and approvals related to its jurisdictional authority
- San Francisco Municipal Transportation Agency
  - Actions and approvals related to its jurisdictional authority
- San Francisco Department of Building Inspection
  - Approval of demolition, excavation, grading, and building permits
  - Other actions and approvals related to its jurisdictional authority
- San Francisco Public Utilities Commission
  - Actions and approvals related to its jurisdictional authority
- San Francisco Recreation and Park Commission
  - Actions and approvals related to its jurisdictional authority
- San Francisco Department of Public Health
  - Approval of a site mitigation plan per San Francisco Health Code article 22A (Maher Ordinance)
  - Approval of a construction dust control plan per San Francisco Health Code article 22B (Construction Dust Control Ordinance)
  - Other actions and approvals related to its jurisdictional authority

Actions by Other Government Agencies

- Bay Area Air Quality Management District
  - Approval of any necessary air quality permits for installation, operation, and testing (e.g., Authority to Construct/Permit to Operate) for individual air pollution sources, such as boilers and emergency standby diesel generator
  - Approval of the Asbestos Dust Mitigation Plan for construction and grading operations per California Code of Regulations Title 17, section 93105

SUMMARY OF POTENTIAL ENVIRONMENTAL ISSUES

The proposed project or its variants could result in potentially significant environmental effects. The planning department will prepare an initial study and an environmental impact report (EIR) to evaluate the physical environmental effects of the proposed project or its variants in accordance with CEQA. The initial study will assess both project-specific and cumulative impacts for all topics in the department's initial study checklist, and will identify which topics may show significant environmental impacts caused by the proposed project or its variants. The EIR will further examine those issues identified in the initial study as having potentially significant effects, identify mitigation measures, and analyze whether the mitigation measures would reduce the environmental effects to a less-than-significant level. The initial study will be published as an appendix to the Draft EIR and the combined document will be circulated for a minimum 45-day public review period.

Pursuant to CEQA Guidelines section 15126.6, the EIR will analyze a reasonable range of alternatives that would reduce or avoid one or more significant environmental impacts identified in the EIR and that address project objectives. The EIR will evaluate a No Project Alternative, which considers reasonably foreseeable physical conditions on the project site, as well as additional project alternatives (such as preservation alternatives) that could potentially reduce or avoid any significant environmental impacts associated with the proposed project or its variants.

The initial study and EIR will address all the environmental issue topics required under CEQA and listed in the San Francisco Planning Department's CEQA environmental checklist.

- Land Use and Planning
- Population and Housing
- Cultural Resources
- Tribal Cultural Resources
- Transportation and Circulation
- Noise
- Air Quality
- Greenhouse Gas Emissions
- Wind
- Shadow
- Recreation
- Utilities and Service Systems
- Public Services
- Biological Resources
- Geology, Soils, and Paleontological Resources
- Hydrology and Water Quality
- Hazards and Hazardous Materials
- Mineral Resources
- Energy
- Agriculture and Forestry Resources
- Wildfire

The EIR will also include a discussion of topics required by CEQA, including the proposed project's growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, any known controversy associated with the proposed project and their environmental effects, and issues to be resolved by decisionmakers.

The proposed project and its variants meet all the requirements of a transit-oriented infill development project under Public Resources Code section 21099; therefore, aesthetics and parking shall not be considered in determining if the project has the potential to result in significant environmental effects. However, visual simulations will be included in the EIR project description for reference.

FINDING

This project could have a significant effect on the environment and a focused environmental impact report will be prepared. This finding is based upon the criteria of the state CEQA Guidelines, sections 15064 (Determining Significant Effects) and 15065 (Mandatory Findings of Significance), and upon the magnitude and nature of proposed project construction and operations as described in the above project description.

PUBLIC SCOPING PROCESS

Pursuant to California Public Resources Code section 21083.9 and CEQA Guidelines section 15206, the planning department will hold a public scoping meeting using an online platform to receive oral comments concerning the scope of the EIR. The meeting will be held on **Wednesday September 2, 2020, starting at 6 p.m**. You can join the meeting via the online platform link found on the Department's webpage, sfplanning.org/sfceqadocs; or via phone, using the following phone number and meeting identification number: 888-475-4499 (Toll Free) and Meeting ID: 925 7763 0432. **This is not a program of the SFMTA. The San Francisco Planning Department is the host of this scoping meeting. The purpose of the meeting is to solicit public comments on the scope of the environmental analysis being prepared for the project by the planning department.** To request a language interpreter or to accommodate persons with disabilities at the scoping meeting, please contact CPC.PotreroYardEIR@sfgov.org or 628-652-7536 at least 72 hours in advance of the meeting.

Written comments will also be accepted at this meeting and until 5 p.m. on September 18, 2020. Written comments should be emailed to Laura Lynch, at CPC.PotreroYardEIR@sfgov.org (preferred) or sent to Laura Lynch, San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103, and should reference the project title and case number on the front of this notice.

If you work for an agency that is a responsible agency, we need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR when considering a permit or other approval for this project. Please include the name of a contact person in your agency.

Members of the public are not required to provide personal identifying information when they communicate with the Commission or the Department. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the department's website or in other public documents.

8/19/2020
Date

Lisa Gibson
Environmental Review Officer

EIR APPENDIX B

Initial Study – Potrero Yard Modernization Project
(including Water Supply Assessment)
June 30, 2021

Initial Study

Record No.:	Planning Department Case No. 2019-021884ENV; State Clearinghouse No. 2020089022, Potrero Yard Modernization Project (2500 Mariposa Street)
Zoning:	Public (P) Zoning District 65-X Height and Bulk District
Plan Area:	Eastern Neighborhoods Area Plan, Mission Area Plan
Block/Lot:	3971/001
Lot Size:	192,000 Square feet
Project Sponsor:	Licinia Iberri, San Francisco Municipal Transportation Agency, 415-646-2715
Staff Contact:	Jennifer McKellar, CPC.PotreroYardEIR@sfgov.org, 628-652-7563

A. Project Description

The Potrero Yard Modernization Project (proposed project) is described in Chapter 2, Project Description, of the environmental impact report (EIR), to which this initial study is attached. EIR Chapter 2 describes four variants to the proposed project that consider modifications to limited features or aspects of the project (pp. 2.56-2.58).

B. Project Setting

The existing setting and land use characteristics are described in EIR Chapter 2, Project Description (pp. 2.3-2.14). The cumulative setting is provided in EIR Chapter 3, Environmental Setting and Impacts, Section 3.A (pp. 3.A.6-3.A.9).

C. Compatibility with Existing Zoning and Plans

	Applicable	*Not Applicable*
Discuss any variances, special authorizations, or changes proposed to the planning code or zoning map, if applicable.	☒	☐
Discuss any conflicts with any adopted plans and goals of the City or region, if applicable.	☒	☐
Discuss any approvals and/or permits from city departments other than the planning department or the Department of Building Inspection, or from regional, state, or federal agencies.	☒	☐

Required Project Approvals

Required variances, special authorizations, and changes to the San Francisco Planning Code (planning code) or zoning map; approvals from City agencies; and approvals from regional, state, or federal agencies (if applicable) for approval of the proposed project are discussed in EIR Chapter 2, Project Description, pp. 2.58-2.61.

Conflicts with Adopted Plans and Policies

In accordance with California Environmental Quality Act (CEQA) Guidelines section 15125(d), this subsection discusses potentially obvious inconsistencies or conflicts of the proposed project or project variants with applicable local and regional plans and policies, as applicable. Inconsistencies or conflicts with existing local and regional plans and policies do not, in and of themselves, indicate a significant physical environmental effect under CEQA. To the extent that adverse physical environmental impacts may result from such inconsistencies or conflicts, these impacts are analyzed in this initial study and EIR under the specific environmental topic sections in Section E, Evaluation of Environmental Effects, and in EIR Chapter 3, Environmental Setting and Impacts, respectively.

Local Plans and Policies

San Francisco General Plan

The San Francisco General Plan (general plan), adopted by the San Francisco Planning Commission (planning commission) and the San Francisco Board of Supervisors (board of supervisors), is both a strategic and long-term document, broad in scope and specific in nature. The general plan is the embodiment of the City's vision for the future of San Francisco. It provides general policies and objectives to guide land use decisions and contains some policies that relate to physical environmental issues. The general plan contains ten elements, each of which pertains to a particular topic that applies citywide: Air Quality, Arts, Commerce and Industry, Community Facilities, Community Safety, Environmental Protection, Housing, Recreation and Open Space, Transportation, and Urban Design.

The general plan also includes area plans that focus on particular areas of the City. Among these is the Mission Area Plan, which is one of the area plans adopted through the Eastern Neighborhoods Planning effort. The project site is in the northeastern portion of the Mission Area Plan, which is discussed in more detail below. In an area plan, "the more general policies in the General Plan elements are made more precise as they relate to specific parts of the city."[1] The area plans contain specific policies and objectives that address land use and planning issues in the local context. As described in EIR Chapter 2, Project Description, the San Francisco Municipal Transportation Agency (SFMTA) as the property owner will act as the project sponsor in coordination with a private project co-sponsor (developer). The SFMTA and private project co-sponsor would seek amendments to the general plan to allow for approval of the proposed project or project variants and would also develop project-specific urban design guidelines. Together the SFMTA and the private project co-sponsor are referred to as the project sponsor team.

Potential conflicts with general policies are discussed below. A potential conflict does not, in itself, indicate a significant effect on the environment within the context of CEQA. Any physical environmental impacts that could result from a conflict with general plan policies are analyzed in this initial study and EIR. In general, potential conflicts with the general plan would be considered by City decision makers (in the case of a general plan amendment, the planning commission and board of supervisors) independently of the environmental review process. Thus, in addition to considering inconsistencies that affect environmental issues, the decision makers

[1] San Francisco Planning Department, San Francisco General Plan, Introduction, October 2012.

consider other potential inconsistencies with the general plan as part of the decision to approve, modify, or disapprove the proposed project or project variants. Any potential conflict not identified in this environmental document would be considered in that context and would not alter the physical environmental effects of the project, which are analyzed in this initial study and EIR.

This subsection is not intended to provide a comprehensive analysis of general plan consistency; in particular, it does not identify policies that the proposed project or project variants would support. Staff report(s) and approval motions prepared for planning commission and board of supervisors' action(s) on the proposed project or project variants as part of the entitlements approval process will contain an analysis of general plan consistency.

The proposed new building would exceed the existing 65-foot height limit as set forth in the planning code and height maps (see discussion under "San Francisco Planning Code," below). The San Francisco General Plan Urban Design Guidelines Map 4, "Urban Design Guidelines for Height of Buildings," illustrates the geographic distribution of the urban design guidelines for heights of buildings, with taller buildings generally concentrated downtown and at high-activity centers and low and small-scaled buildings generally concentrated in residential areas away from commercial activity centers. San Francisco General Plan Urban Design Guidelines Policy 3.5 provides general guidance on heights of buildings and their relationship with the urban form but does not set limits on heights. Additionally, Mission Area Plan objectives and policies (discussed below under "Mission Area Plan") address height, architectural design, and the role of new development. With respect to height, the area plan's emphasis related to greater height allowances is at specific locations, e.g., along Mission Street (to the west) and the Potrero Center (to the north), while additional height for new development along alleyways is discouraged.

In its current conceptual design without any legislative changes, the proposed building's height (up to 150 feet) would not conform with Map 4, Policy 3.5, and the Mission Area Plan as it pertains to the height of new buildings. The proposed project or project variants would amend Map 4 and the existing 65-X Height and Bulk District to allow for the proposed replacement transit facility and joint development to rise to a height of 150 feet at the project site location. Planning code provisions through a new special use district are required and would address the proposed building's height as it relates to the neighboring structures. While the scale of the proposed project or project variants would be noticeably taller and larger than the surrounding neighborhood, the proposed project or project variants would incorporate new urban design guidelines into the proposed special use district (see further discussion below under "San Francisco Planning Code") that would address the need to include design interventions to relate the design of the project to the smaller scale surrounding buildings through upper-story setbacks, horizontal and vertical building articulation, and other architectural interventions.

As noted in initial study Section E.2, Aesthetics, p. 18, the proposed project and project variants meet each of the criteria provided by Public Resources Code (CEQA) section 21099(d); thus, the determination of significance of project impacts under CEQA does not consider aesthetics. However, the City may consider Urban Design Element policies during the subsequent design review process, separate from environmental review.

Mission Area Plan

The project site is located within the Mission Area Plan, one of four area plans analyzed in the Eastern Neighborhoods Rezoning and Area Plans EIR that was adopted in December 2008.[2] The Mission Area Plan envisions the preservation and enhancement of the community's diverse neighborhood and economic infrastructure, varied housing stock, architecturally and culturally rich character, and accessible and reliable transportation infrastructure. To achieve this vision, the Mission Area Plan includes objectives and policies arrayed into the following eight categories: land use, housing, built form, transportation, streets and open space, economic development, community facilities, and historic preservation.

One of the principal goals of the Mission Area Plan is to boost the supply of affordable housing and minimize population displacement. The area plan's housing section identifies policies intended to address six objectives that aim for new affordable housing that is constructed in an economically efficient manner to meet diverse population needs and lower production costs (Objectives 2.1, 2.3, 2.4, and 2.6), to preserve and enhance the existing housing supply (Objective 2.2), and to promote the health and well-being of residents through desirable residential design and location (Objective 2.5).

The Mission Area Plan also emphasizes the preservation of historic properties, built form, and land use patterns. The area plan's historic properties and built form sections aim to preserve historic resources and ensure historic resource considerations are integrated into the planning processes, while striving to reinforce the neighborhood's distinctive urban fabric and character. Refer to EIR Section 3.B, Cultural Resources, for a discussion of the proposed project's or project variants' impacts on historic architectural resources.

The Mission Area Plan's land use section aims to strengthen the mixed-use character while maintaining production, distribution, and repair (PDR) business activities. The area plan's land use map, Map 2, "Mission Generalized Zoning Districts," identifies the project site and immediate area as the Northeast Mission, which aims to maintain the area's mixed-use character and PDR business activities. The Northeast Mission Industrial Zone encompasses the proposed project site and includes a range of PDR uses, including, but not limited to, auto repair establishments, food processing, catering, graphic design, printing, photographic services, and communications. The zone also contains a number of cultural, institutional, educational uses, and a few large-format retail establishments. A defining characteristic of the zone is the high concentration of PDR uses near the area's surrounding residential uses, with enclaves of small-lot Victorian and Edwardian-era homes.

The proposed project or project variants would not be obviously inconsistent with the Mission Area Plan objectives and policies regarding housing, land use, and transportation. The proposed project or project variants would provide mixed-income and affordable residential units, bicycle parking, and retail space.

[2] San Francisco Planning Department, Eastern Neighborhoods Rezoning and Area Plans Final Environmental Impact Report, Case No. 2004.0160E, certified August 7, 2008, *https://sfplanning.org/eastern-neighborhoods-plans*, accessed March 23, 2021.

San Francisco Planning Code

The San Francisco Planning Code, which incorporates by reference the City's zoning maps, governs permitted uses, densities, and the configuration of buildings within San Francisco. Permits to construct new buildings (or to alter or demolish existing ones) may not be issued unless a project complies with the planning code or an exception is available under the code.

Priority Policies

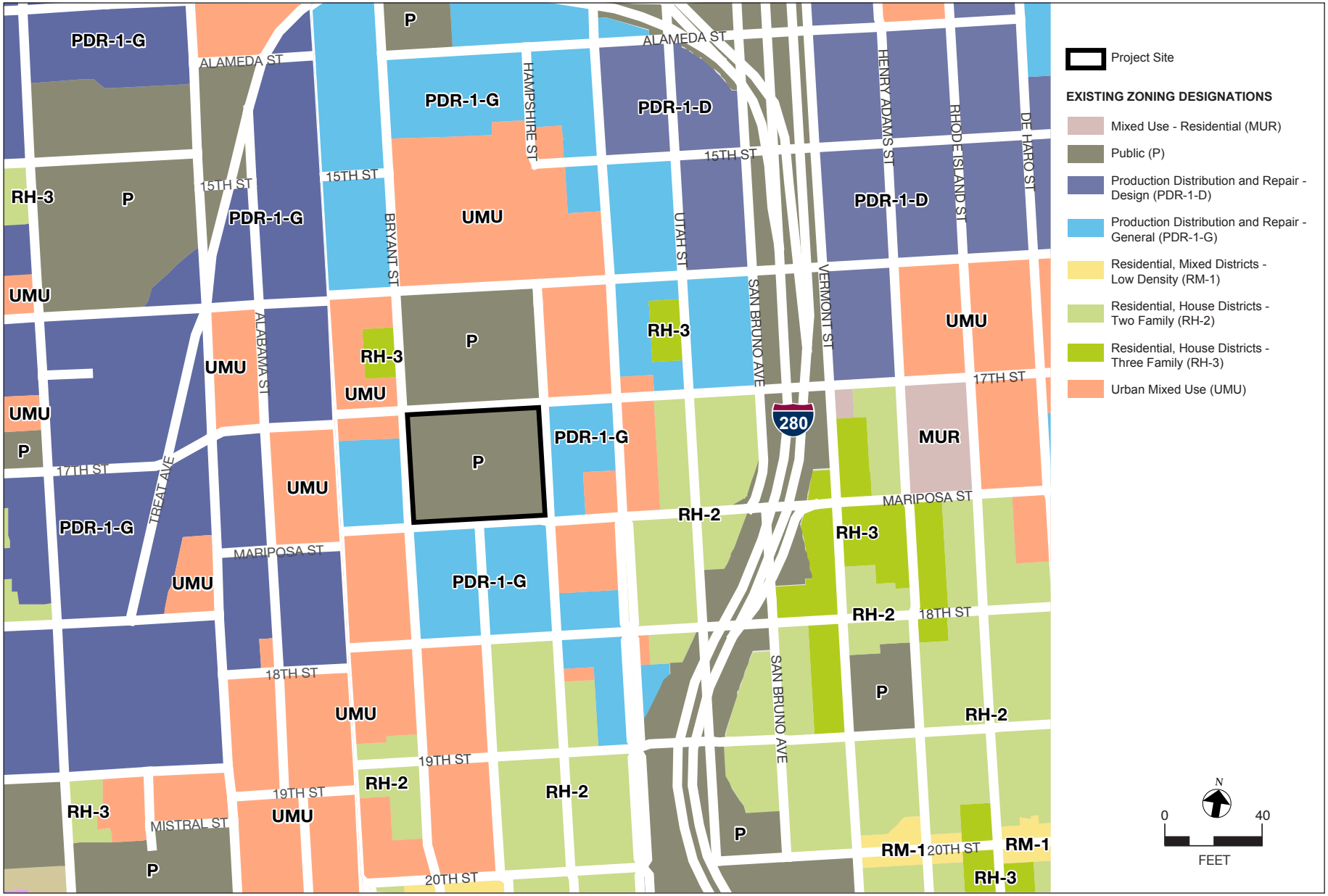
Planning Code section 101.1 establishes priority policies, which are also included in the preamble to the general plan, and this section is generally applicable to the proposed project and project variants. It requires that the City find that the proposed project or project variants is on balance and is consistent with eight priority policies. These policies are further discussed under "The Accountable Planning Initiative," below.

Zoning

The project site is located entirely within a Public Use (P) Zoning District (see Figure 1: Existing Zoning Districts). As described in planning code section 211 et seq., the P Zoning District applies to land owned by a governmental agency and in some form of public use and may consist of principal or conditional uses. Principal uses include structures and uses of governmental agencies, public structures and uses of the City and County of San Francisco, accessory nonpublic uses that meet specific conditions, and certain land uses and facilities, including City plazas, neighborhood agriculture, telecommunication facilities, 100 percent affordable housing projects, and Educator Housing Projects. Conditional uses require conditional authorizations and include, but are not limited to, social service and philanthropic facilities, religious institutions, community facilities, schools, and religious institutions.

The proposed project or project variants would include residential and neighborhood-commercial uses that would not conform to the allowable uses associated with the P Zoning District. The proposed project or project variants would amend the zoning map and the planning code, adding a new special use district. If approved by the planning commission and board of supervisors, the special use district would establish land use zoning controls and incorporate design standards and guidelines for the site. The San Francisco Zoning Map would be amended to reflect the special use district and may include conditional use authorization for a planned unit development. While the residential and commercial uses proposed under the proposed project or project variants are not permitted under existing zoning, if the rezoning is approved, project uses would be permitted on the site.

The project site is located within a 65-X Height and Bulk District, which limits the maximum allowable height on the site to 65 feet (see Figure 2: Existing Height and Bulk Districts). An "X" bulk designation sets no maximum length or diagonal dimensions for structures. The maximum bulk of structures in an "X" bulk district is limited by other controls such as required setbacks and yards, height limits, and other planning code requirements. Building heights under the proposed project or project variants are inconsistent with the existing height limits on the project site.

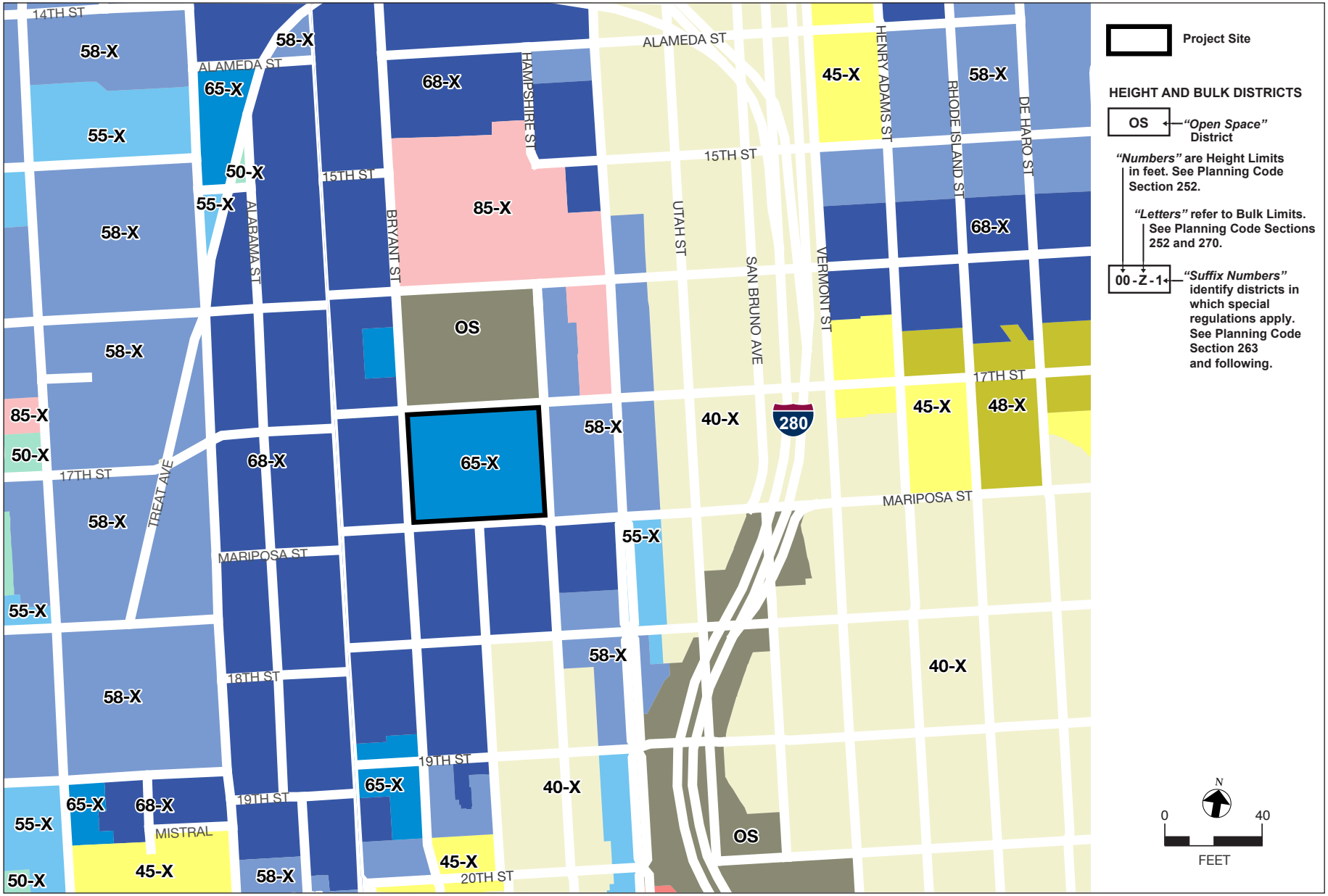


Source: City & County of San Francisco Planning Department, 2019 and 2020

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 1: EXISTING ZONING DISTRICTS



Source: City & County of San Francisco Planning Department, 2017 and 2019

POTRERO YARD MODERNIZATION PROJECT

2019-021884ENV

FIGURE 2: EXISTING HEIGHT AND BULK DISTRICTS

The proposed project or project variants would amend the existing 65-X Height and Bulk District in the zoning map to a height limit of 150 feet to allow for the proposed project or project variants that would rise to heights ranging from 75 to 150 feet. If the rezoning is approved with respect to height limits, building heights under the proposed project or project variants would be consistent with the revised height and bulk requirements applicable to the project site. Thus, the project sponsor proposes the establishment of a new special use district further discussed below.

Special Use District

As mentioned above and noted in EIR Chapter 2, Project Description, on p. 2.58 under "Anticipated Project Approvals," the project sponsor proposes the establishment of a new special use district with respect to the project site and allowable land uses, height, and bulk. The special use district would require a recommendation by the planning commission and approval by the board of supervisors, including approval of zoning map amendments to establish boundaries of the special use district, to establish the zoning controls for the project site to accommodate the proposed residential and neighborhood-commercial uses, and to modify the allowable height at the site from 65 feet to 150 feet. The City's zoning map would be amended to retain the underlying current zoning district (P zoning) and show the change from the height and bulk district (65-X Height and Bulk District) to the proposed designations through the establishment of the boundaries of the new special use district. With adoption of the proposed special use district and the ordinance amending the zoning map, height map, and special use district map, the proposed project or project variants would be consistent with the planning code and applicable maps.

Affordable Housing

The proposed project or project variants would meet the requirements of the City's Residential Inclusionary Affordable Housing Program (planning code sections 415 et seq.), which requires projects of 10 or more residential units to contribute to the creation of affordable housing. The project sponsor is coordinating with City staff to ensure that the residential uses under the proposed project or project variants (up to 575 housing units) would include a minimum of 50 percent of the total as affordable housing units.

The Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the planning code and established eight Priority Policies. These policies are (1) preservation and enhancement of neighborhood-serving retail uses and future opportunities for resident employment in and ownership of such businesses; (2) conservation and protection of existing housing and neighborhood character to preserve the cultural and economic diversity of neighborhoods (discussed in initial study Section E.3, Population and Housing); (3) preservation and enhancement of affordable housing (discussed in initial study Section E.3, Population and Housing); (4) discouragement of commuter automobiles that impede Muni transit service or that overburden streets or neighborhood parking (discussed in EIR Section 3.C, Transportation and Circulation); (5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership (discussed in initial study sections E.1, Land Use and Planning and

E.3, Population and Housing); (6) maximization of earthquake preparedness (discussed in initial study Section E.16, Geology and Soils); (7) preservation of landmarks and historic buildings (discussed in EIR Section 3.B, Cultural Resources); and (8) protection of parks and open space and their access to sunlight and vistas (discussed in EIR Section 3.G, Shadow, and initial study Section E.12, Recreation).

Prior to issuing a permit approving any demolition, conversion, or change of use, and any action that requires a finding of consistency with the general plan, the City must find that the proposed project or project variants would be consistent with the priority policies, on balance. The staff reports and approval motions prepared for the decision makers will include a comprehensive project analysis and findings regarding the consistency of the proposed project or project variants with the Priority Policies.

Other Local Plans and Policies

In addition to the general plan and the planning code, other local plans and policies that are relevant to the proposed project are as follows:

- The Climate Action Strategy for San Francisco is a local action plan that examines the causes of global climate change and the human activities that contribute to global warming. It provides projections of climate change impacts on California and San Francisco based on recent scientific reports, presents estimates of San Francisco's baseline greenhouse gas emissions inventory and reduction targets, and describes recommended actions for reducing the City's greenhouse gas emissions.
- The Transit-First Policy (City Charter, section 8A.115) is a set of principles that underscore the City's commitment to give priority to traveling by transit, bicycle, and on foot over traveling by private automobile. These principles are embodied in the objectives and policies of the Transportation Element of the general plan. All City boards, commissions, and departments are required by law to implement Transit First principles in conducting the City's affairs.
- The San Francisco Bicycle Plan is a citywide bicycle transportation plan that identifies short-term, long-term, and other minor improvements to San Francisco's bicycle route network. The overall goal of the San Francisco Bicycle Plan is to make bicycling an integral part of daily life in San Francisco.
- The San Francisco Better Streets Plan consists of illustrative typologies, standards, and guidelines for the design of San Francisco's pedestrian environment, with the central focus of enhancing the livability of the City's streets.
- Vision Zero is a policy to eliminate all traffic deaths in San Francisco by the year 2024. The goal of Vision Zero is also to reduce severe injury inequities across neighborhoods, transportation modes, and populations. Vision Zero has been adopted by both the San Francisco Board of Supervisors and the SFMTA. Some actions the SFMTA has taken and will take to improve pedestrian safety include implementing safer signal timing at intersections, adding "continental" crosswalks (crosswalks with zebra striping), changing signals to "leading" pedestrian signals that allow pedestrians to get a head start at signalized intersections, adding red zones at intersections to improve visibility, and adding pedestrian bulbs to shorten pedestrian crossing distances.

The proposed project and its variants have been reviewed against these local plans and policies and would not obviously conflict with them due to the size, location, and infill nature of the proposed development.

Regional Plans and Policies

In addition to local plans and policies, there are several regional planning agencies whose environmental, land use, and transportation plans and policies consider the growth and development of the nine-county San Francisco Bay Area. Some of these plans and policies are advisory, and some include specific goals and provisions that must be adhered to when evaluating a project under CEQA. The regional plans and policies that are relevant to the proposed project or project variants are as follows:

- Plan Bay Area was prepared by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) and includes the Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area. Plan Bay Area is a long-range integrated land use and transportation plan for the nine-county Bay Area that covers the period from 2010 to 2040. Plan Bay Area calls for concentrating housing and job growth around transit corridors, particularly within areas identified by local jurisdictions as Priority Development Areas. Assumptions for land use development are from local and regional planning documents. Plan Bay Area 2040 was adopted on July 26, 2017, and will be updated every four years. It is a limited and focused update of the region's previous integrated transportation and land use plan adopted in July 2013. The project site is located within the Eastern Neighborhoods Priority Development Area, which includes East South of Market (SoMa), Western SoMa, Central SoMa, the Mission District, Showplace Square and Potrero Hill, and the Central Waterfront.
- In addition, Plan Bay Area specifies strategies and investments for maintaining, managing, and improving the region's multi-modal transportation network and proposes transportation projects and programs to be implemented with reasonably anticipated revenue, as identified by local jurisdictions. Plan Bay Area also provides a list of transportation projects for highway, transit, rail, and related uses through 2040 for the nine Bay Area counties. The SFMTA's Transit Fleet Management Plan, intended to accommodate growth in public transit through 2040, is part of Plan Bay Area 2040.
- In spring 2018, ABAG and MTC initiated the planning process for the update to the 2017 plan: Plan Bay Area 2050.[3] It includes 35 strategic transportation, housing, economic, and environmental policy initiatives and/or investment strategies to sustainably guide the region to 2050. The impacts of the plan's proposed regional pattern of household and employment growth, transportation investments, and resilience investments will be assessed as part of a program-level environmental review.[4] The Notice of Preparation for the Draft EIR for Plan Bay Area 2050 (Regional Transportation Plan/Sustainable Communities Strategy for the Nine-County San Francisco Bay Area) was published on September 28, 2020, initiating a 30-day review period that ended on October 28, 2020. A public scoping meeting was held on October 15, 2020. The Draft EIR is anticipated to be released in spring 2021 with certification of the Final EIR in fall 2021.
- ABAG' Projections 2013 is an advisory policy document that includes population and employment forecasts to assist in the development of local and regional plans and policy documents. It received minor updates as part of Plan Bay Area 2040. The strategic framework for growth and investment through 2050 in Plan Bay Area 2050 is premised on the recently adopted 2020 Regional Growth Forecast. It identifies how much the Bay Area might grow between Plan Bay Area 2050's baseline year (2015) and its horizon year (2050), including population, jobs, households and associated housing units.

[3] Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2050, *https://www.planbayarea.org/plan-bay-area-2050-1*, accessed December 3, 2020.

[4] Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2050, Environmental Review Information, *https://www.planbayarea.org/2050-plan/eir-environmental-impact-report*, accessed December 3, 2020.

- The Bay Area Air Quality Management District's Bay Area 2017 Clean Air Plan updated the 2010 Clean Air Plan. In accordance with the requirements of the California Clean Air Act the clean air plan includes all feasible measures to reduce ozone and provides a control strategy to reduce ozone, particulate matter, air toxics, and greenhouse gas emissions throughout the region. The clean air plan also describes the status of local air quality and identifies emission control measures to be implemented.
- The Regional Water Quality Control Board's Water Quality Control Plan for the San Francisco Bay Basin is a master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the state, including surface waters and groundwater, and includes implementation programs to achieve water quality objectives.

The proposed project and project variants have been reviewed against these regional plans and policies. Due to the size, location, and infill nature of the proposed project or project variants, no obvious conflicts with any of the above plans or policies would occur.

D. Summary of Environmental Effects

The proposed project or project variants could potentially affect the environmental topic(s) checked below. The following pages present a more detailed checklist and discussion of each environmental topic.

☐ Land Use and Planning	☐ Greenhouse Gas Emissions	☒ Geology and Soils
☐ Population and Housing	☒ Wind	☐ Hydrology and Water Quality
☒ Cultural Resources	☒ Shadow	☐ Hazards and Hazardous Materials
☒ Tribal Cultural Resources	☐ Recreation	☐ Mineral Resources
☒ Transportation and Circulation	☐ Utilities and Service Systems	☐ Energy Resources
☒ Noise	☐ Public Services	☐ Agriculture and Forestry Resources
☒ Air Quality	☐ Biological Resources	☐ Wildfire

Approach to Analysis

This initial study examines the proposed project and project variants to identify potential effects on the environment. As stated in EIR Chapter 2, Project Description, pp. 2.49-2.54, the proposed project or project variants would be subject to the San Francisco Public Works' (public works') Standard Construction Measures (SCMs) because public works would have a role in oversight of the project construction contracts. The SCMs that would be incorporated into the proposed project or project variants are related to the following: seismic and geotechnical considerations, air quality, water quality, traffic, noise, hazardous materials, biological resources (bird protection, tree conservation, environmentally sensitive areas), visual and aesthetic considerations (project site), and cultural resources (archeological and historic architectural resources) (see EIR Chapter 2, Table 2.3: San Francisco Public Works Standard Construction Measures). EIR Appendix C, Standard Construction Measures for Public Works Projects and Draft Construction Contract Procedures, contains a copy of the SCMs and their attachments.

The following approach to analysis is used in this initial study to determine which topics require no additional environmental analysis beyond what is presented in this initial study and which topics require more detailed analysis in this EIR.

The conclusions regarding potential significant environmental effects are based upon field observations, staff and consultant experience and expertise on similar projects, and/or standard reference materials available at the San Francisco Planning Department (planning department), such as the Transportation Impact Analysis Guidelines for Environmental Review, the California Natural Diversity Database and maps published by the California Department of Fish and Wildlife, the California Division of Mines and Geology Mineral Resource Zone map and designations, and the California Department of Conservation's Farmland Mapping and Monitoring Program.

For each topic on the Initial Study Checklist, the evaluation has considered the impacts of the proposed project or project variants both individually and cumulatively. All topics on the Initial Study Checklist that have been checked "Less than Significant Impact with Mitigation Incorporated," "Less than Significant Impact," "No Impact," or "Not Applicable" indicate that, upon evaluation, staff has determined that the proposed project or project variants could not have a significant adverse environmental effect relating to that issue. A discussion is included for those issues checked "Less than Significant Impact with Mitigation Incorporated" and "Less than Significant Impact" and for most topics checked with "No Impact" or "Not Applicable."

All identified mitigation measures listed in Section G, Mitigation Measures, will be incorporated into the proposed project or project variants as conditions of approval.

Whenever an impact is identified as "Potentially Significant," that potential impact will be analyzed in the EIR. The "Potentially Significant" designation is used solely to identify topics that will be addressed in detail in the EIR for the proposed project and project variants and does not reflect a determination that the proposed project or project variants will result in a significant impact on these resources. These topics are being included in the EIR because additional analysis is needed to determine the potential effect with respect to those issues.

Significance criteria that do not apply to the proposed project, if any, are first identified, and neither this initial study nor this EIR provide further discussion of those criteria; for example, since the project site is not located within an airport land use plan, none of those criteria apply to this project.

Cumulative Impact Analysis

Two approaches to a cumulative impact analysis are provided in CEQA Guidelines section 15130(b)(1): (a) the analysis can be based on a list of cumulative projects producing closely related impacts that could combine with those of a proposed project; or (b) a summary of projections contained in a general plan or related planning document can be used to determine cumulative impacts. The analyses in this initial study employ a combination of the list-based approach and projections from the general plan or other related planning documents, as appropriate.

Cumulative projects that could potentially contribute to cumulative impacts on various resource topics are listed in EIR Table 3.A.1, Cumulative Projects, and shown on EIR Figure 3.A.1, Cumulative Projects, pp. 3.A.7-3.A.9. See EIR Chapter 3, Environmental Setting and Impacts, Section 3.A.

Effects Found to Be Potentially Significant

Based on this initial study, the topics for which there is the potential for project-specific effects to be significant or for which the analysis requires additional detail are analyzed in this focused EIR and are as follows:

- Cultural Resources (historic architectural resources only)
- Transportation and Circulation (all topics)
- Noise (all topics except aviation-related ones)
- Air Quality (all topics)
- Wind
- Shadow

Effects Found Not to Be Significant

The initial study determined that the potential individual and cumulative environmental effects on the following resource topics are not applicable, no impact, less than significant, or would be reduced to a less-than-significant level through recommended mitigation measures included in this initial study:

- Land Use and Planning (all topics)
- Population and Housing (all topics)
- Cultural Resources (archeological resources and human remains)
- Tribal Cultural Resources (all topics)
- Noise (aviation-related topics)
- Greenhouse Gas Emissions (all topics)
- Recreation (all topics)
- Utilities and Service Systems (all topics)
- Public Services (all topics)
- Biological Resources (all topics)
- Geology and Soils (all topics)
- Hydrology and Water Quality (all topics)
- Hazards and Hazardous Materials (all topics)
- Mineral Resources (all topics)
- Energy (all topics)
- Agriculture and Forestry Resources (all topics)
- Wildfire (all topics)

These topics are discussed with mitigation measures, where appropriate, in Section E of this initial study, and require no further environmental analysis in this EIR. As noted above, all identified mitigation measures listed in Section G of this initial study will be imposed on the proposed project or project variants as conditions of approval.

E. Evaluation of Environmental Effects

E.1 Land Use and Planning

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
1. LAND USE AND PLANNING. Would the project:					
a) Physically divide an established community?	☐	☐	☒	☐	☐
b) Cause a significant physical environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐	☐

Summary of Land Use and Planning Comments Received in Response to the Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting

Issues identified in public comments on the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) and Notice of Public Scoping Meeting related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. Comments on the NOP received during the NOP scoping period and related to land use expressed concern with impacts on the existing character of the industrial and artist businesses in the Mission District and how these impacts will be alleviated (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Effects on existing neighborhood character are no longer considered in determining the significance of a land use and planning impact under CEQA. As described below in initial study Section E.2, Aesthetics, City decisionmakers can consider the proposed project's or project variants' architectural and urban design during their deliberations on the merits of the proposed project or its variants and as part of their actions to approve, modify, or disapprove the proposed project or project variants.

Project-Specific Impacts

Impact LU-1: The proposed project or project variants would not physically divide an established community. (*Less than Significant*)

The existing 4.4-acre project site occupies the equivalent of roughly two typical city blocks within the generally rectangular street grid of the surrounding Mission neighborhood. It is bounded on three sides by sloping western, northern, and eastern edges that surround a sunken and fenced trolley bus storage yard on its western portion and a predominantly single-story maintenance and operations building on its eastern portion. Direct vehicular access to the site is provided along 17th Street (north side) via a gated entry west of Hampshire Street and along Mariposa Street (south side) via gated entries between Bryant and York streets. No direct pedestrian or vehicular access to the project site is available from the east or west. Potrero Yard has perimeter fencing and controlled entry to the bus parking lots and the maintenance and operations building, and pedestrians cannot walk through the site.

Implementation of the proposed project or project variants would result in the construction of a replacement transit facility with integrated residential and neighborhood-commercial uses within the established lot boundaries that would range in height from approximately 75 to 150 feet, as measured on the Mariposa Street elevation (excluding rooftop mechanical equipment enclosures and other rooftop appurtenances). The proposed project or project variants would increase the intensity of public land uses on the project site, as well as introduce a new mix of residential and neighborhood-commercial uses. However, the proposed project or project variants would not result in the construction of a physical barrier to neighborhood access or the removal of an existing means of access through alteration of the established street grid or permanent closure of any streets or sidewalks. Although the sidewalks and portions of streets adjacent to the project site (e.g., Hampshire and Mariposa streets) could be closed for periods of time during project construction, these closures would be temporary and occur only during construction.

For these reasons, the proposed project or project variants would have a less-than-significant effect with respect to physically dividing the surrounding community, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact LU-2: The proposed project or project variants would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, such that a significant environmental impact would result. (*Less than Significant*)

Applicable plans, policies, or regulations that govern development on the project site include the San Francisco General Plan (general plan), the Mission Area Plan (an area plan of the general plan), the planning code, the Better Streets Plan, and the Accountable Planning Initiative. Applicable regional plans include the Plan Bay Area 2040.[5] Initial study Section C, Compatibility with Existing Zoning and Plans, generally describes the proposed project's or project variants' potential inconsistencies with these plans, policies, or regulations.

The proposed project or project variants would not obviously be inconsistent with the general plan and the area plan objectives and policies and would not obviously or substantially conflict with any adopted environmental plan or policy. Refer to EIR Section 3.B, Cultural Resources, for a discussion of the project's impacts on historic architectural resources.

As proposed, the project would not conform to the existing P (Public Use) Zoning and 65-X Height and Bulk Districts. Although the expansion of transit uses on the project site would conform with the allowed uses under the existing P Zoning District, the introduction of new market-rate residential land uses would not. Principally permitted uses in the P Zoning District include residential land uses that are 100 percent affordable housing projects or educator housing projects; however, market-rate residential uses are not allowed as a principal or conditional use. The ground-floor neighborhood-commercial use could be principally permitted in the existing P Zoning District, which allows an accessory use that is not formula retail and that conforms to the principally permitted use of the nearest adjacent non-residential zoning district. The adjacent non-residential zoning districts are PDR-1-G, which allows

[5] Other regional plans, such as the 2017 Clean Air Plan and the Basin Plan concerning San Francisco Bay, address specific environmental resources and are discussed in initial study Section C, Compatibility with Existing Zoning and Plans.

many commercial uses as principally permitted. However, a neighborhood-commercial use (that is not below a publicly accessible parking garage) is not allowed as the principal use in a P Zoning District. Therefore, amendments to the general plan, the area plan, and the planning code and zoning map (adding a new special use district) would be required as part of the proposed project or project variants.

If the proposed project or one of the project variants is approved by the planning commission and board of supervisors, the special use district would establish the new allowable land uses, zoning, height and bulk controls, and incorporate design standards and guidelines for the project site. San Francisco Zoning Map sheets would subsequently be amended to show the current zoning designation (P [Public Use]) with amendments to the height and bulk controls and the new special use district. While the residential and neighborhood-commercial uses and heights over 65 feet proposed under the project are not permitted under existing zoning and height limits, if the rezoning and height limit reclassification are approved, the proposed uses and building heights (ranging from 75 feet to up to 150 feet) would be permitted on the site.

Conflicts with existing plans, policies, and regulations do not necessarily indicate a significant environmental land use impact under CEQA, unless the project substantially conflicts with a land use plan/policy that was adopted for the purpose of avoiding or mitigating environmental effects, such that a substantial adverse physical change in the environment related to land use would result. To the extent that such substantial physical environmental impacts may result from such conflicts, this initial study and EIR disclose and analyze these physical impacts under the relevant environmental topic sections.

Potential conflicts with applicable general plan objectives and policies, including those in the area plan, will continue to be analyzed and considered as planning department case reports and draft motions are prepared as part of the review of entitlement applications required for the proposed project, which are independent of environmental review under CEQA. The case reports, draft motions, and CEQA documents also will be considered by the decision makers during their deliberations on the merits of the proposed project or project variants and as part of their actions to approve, modify, or disapprove the proposed project or project variants. Therefore, the proposed project or project variants would have a less-than-significant impact with regard to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. Mitigation measures are not required. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-LU-1: The proposed project or project variants, in combination with cumulative projects in the vicinity and larger planning area, would not result in significant cumulative land use impacts. (*Less than Significant*)

The cumulative context for land use effects is typically localized, within the immediate vicinity of the project site, or at the neighborhood level. Cumulative projects within an approximately 0.25-mile radius of the project site are listed in EIR Table 3.A.1 and shown on EIR Figure 3.A.1, pp. 3.A.7-3.A.9. From the larger planning area perspective, several area plans have identified the southeastern part of San Francisco as the location for substantial future housing and employment growth. These include the five Eastern Neighborhoods area plans (East SoMa, Western SoMa,

Showplace Square/Potrero Hill, Central Waterfront, and Mission, where the project site is located), the Mission Bay Redevelopment Plan, the Bayview Hunters Point Area Plan, and plans for the former Hunters Point Shipyard, Candlestick Point, Visitacion Valley, and Executive Park. The proposed project or project variants would add to future growth in housing and employment in the southeastern part of the City (see initial study Section E.3 Population and Housing, for further discussion).

The cumulative projects within the vicinity include development of new residential units, PDR space, institutional space, and commercial and retail space. The list of cumulative projects also identifies a transportation infrastructure project and a parking management plan that do not call for changes to existing land uses. Like the proposed project or project variants, the cumulative projects consist of the redevelopment of infill sites. When the closest cumulative projects at 1850 Bryant Street and at 2601 Mariposa Street are operating, this would result in the intensification of institutional, commercial, and PDR uses in the immediate project vicinity. Nearby cumulative projects such as 321 Florida Street, 2435-2455 16th Street, 681 Florida Street, and 2750 19th Street are mixed-use projects that would increase the supply of housing units and the amount of commercial and PDR space in the neighborhood.

As discussed above under Impact LU-1, and in EIR Chapter 2, Project Description, the proposed project or project variants would improve the immediate environment in accordance with the Better Streets Plan and Mission District Streetscape Plan including the network of bicycle lanes, sidewalks, curb ramps, and intersection crosswalks, all of which would enhance pedestrian and bicycle circulation. None of these changes would introduce physical divisions that would limit public access to the site or surrounding areas. Cumulative projects in the immediate vicinity and in the larger planning areas that cover much of the eastern part of the City would likewise enhance the circulation network in accordance with the Better Streets Plan. Therefore, none of these projects would divide an established community, nor would they combine to do so in a cumulative manner. Accordingly, cumulative effects related to physical division of established communities would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

The proposed project or project variants would combine with cumulative projects in the immediate vicinity and with growth in the area plans listed above to continue the transformation of much of eastern San Francisco from a substantially industrial area to a mixed-use residential-commercial area. This transformation would be largely consistent with both adopted local and regional plans, including the plans noted above and Plan Bay Area 2040.

The conflicts of the proposed project or project variants with existing land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect, discussed above under Impact LU-2, would be less than significant. To the extent that substantial physical environmental impacts may result from such conflicts, the cumulative physical impacts are addressed and analyzed in this initial study and in EIR Chapter 3, Environmental Setting and Impacts.

Given the above, the proposed project or project variants, in combination with cumulative projects in the vicinity and larger planning area, would have less-than-significant cumulative land use and planning impacts. Mitigation measures are not required. This topic will not be discussed in the EIR.

E.2 Aesthetics

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
2. AESTHETICS. Except as provided in Public Resources Code section 21099, would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☐	☒

CEQA Section 21099

CEQA section 21099(d) – Modernization of Transportation Analysis for Transit Oriented Infill Projects, effective January 1, 2014, provides that "aesthetics and parking impacts of a residential, mixed-use residential, or employment center project on an infill site located within a transit priority area shall not be considered significant impacts on the environment." Accordingly, aesthetics and parking are not considered in determining if a project has the potential to result in significant environmental effects, provided the project meets the following three criteria:

1) The project is in a transit priority area; and
2) The project is on an infill site; and
3) The project is residential, mixed-use residential, or an employment center.

The proposed project or project variants meet each of the above three criteria, and thus this initial study does not consider aesthetics and the adequacy of parking in determining the significance of project impacts under CEQA.[6]

[6] San Francisco Planning Department, Eligibility Checklist: CEQA Section 21099 – Modernization of Transportation Analysis, 2500 Mariposa St - SFMTA Potrero Yard Modernization Project, Case No. 2019-021884ENV, April 9, 2021.

CEQA section 21099(e) states that a Lead Agency maintains the authority to consider aesthetic impacts pursuant to local design review ordinances or other discretionary powers and that aesthetics impacts do not include impacts on historical or cultural resources. As such, there will be no change in the planning department's methodology related to design and historic review.

The planning department recognizes that the public and decision makers nonetheless may be interested in information pertaining to the aesthetic effects of a proposed project and may desire that such information be provided as part of the environmental review process. Therefore, some of the information that would have otherwise been provided in an aesthetics section of an initial study or EIR (such as "before" and "after" visual simulations) has been included in the EIR Chapter 2, Project Description (see pp. 2.29-2.32). However, this information is provided solely for informational purposes and is not used to determine the significance of the environmental impacts of the project, pursuant to CEQA.

In addition, CEQA section 21099(d)(2) states that a Lead Agency maintains the authority to consider aesthetic impacts pursuant to local design review ordinances or other discretionary powers and that aesthetics impacts do not include impacts on historical or cultural resources.

E.3 Population and Housing

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
3. POPULATION AND HOUSING. Would the project:					
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐	☐
b) Displace substantial numbers of existing people or housing units necessitating the construction of replacement housing?	☐	☐	☒	☐	☐

Summary of Population and Housing Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. Comments on the NOP received during the NOP scoping period and related to population and housing expressed concern with gentrification, housing costs, effects on the Muni workforce, and the jobs-housing balance (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

Impact PH-1: The proposed project or project variants would not directly or indirectly induce substantial unplanned population growth in an area. (*Less than Significant*)

Population Growth

The Association of Bay Area Governments (ABAG) prepares projections of employment and housing growth for the Bay Area. Plan Bay Area (approved in 2013) included ABAG's Projections 2013, which includes population, employment, and household growth by county for the nine-county Bay Area through 2040.[7] Plan Bay Area projects that much of the new housing growth will consist of infill development centered around business districts and transit corridors. To facilitate that, Plan Bay Area focuses growth and development in nearly 200 Priority Development Areas (PDAs). These existing neighborhoods are served by public transit and have been identified as appropriate for additional, compact development.[8] The project site is located within the Eastern Neighborhoods PDA in San Francisco.[9] The latest projections were prepared as part of Plan Bay Area 2040, adopted in 2017 by the Metropolitan Transportation Commission (MTC) and ABAG. In spring 2018, the MTC and ABAG initiated the planning process for the update to the 2017 plan: Plan Bay Area 2050. This update outlines the strategic framework for growth and investment through 2050 using the 2020 Regional Growth Forecast.[10] The impacts of the plan's proposed regional pattern of household and employment growth, transportation investments, and resilience investments will be assessed as part of a program-level environmental review.[11] The Draft EIR is anticipated to be released in spring 2021 with certification of the Final EIR in fall 2021.

According to the U.S. Census Bureau's 2019 American Community Survey,[12] the City and County of San Francisco had an estimated population of about 881,549 residents and 406,413 housing units. The growth projections prepared by ABAG for Plan Bay Area 2040 and updated in May 2019 for San Francisco County anticipate 483,695 households in 2040 (an increase of 137,885 households between 2010 and 2040), which is consistent with the housing element and other adopted plans. San Francisco's total population is anticipated to be

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7 Growth projections for Eastern Neighborhoods PDA included with ABAG Projections 2013. MTC and ABAG, Plan Bay Area Final Forecast of Jobs, Population and Housing, Appendix B: Housing Growth by Jurisdiction and PDA, July 2013, p. 58, *http://files.mtc.ca.gov/library/pub/28450.pdf*, accessed March 26, 2021.

8 Metropolitan Transportation Commission and Association of Bay Area Government (MTC and ABAG), Plan Bay Area 2040 - Final, July 26, 2017, p. 43, *http://files.mtc.ca.gov/library/pub/30060.pdf*, accessed May 18, 2021.

9 MTC and ABAG, Priority Development Areas (Plan Bay Area 2050), *https://opendata.mtc.ca.gov/datasets/MTC::priority-development-areas-plan-bay-area-2050/explore?location=37.765533%2C-122.433524%2C12.34*, accessed May 26, 2021.

10 The 2020 regional growth forecast identifies how much the Bay Area might grow between Plan Bay Area 2050's baseline year (2015) and its horizon year (2050), including population, jobs, households and associated housing units. The methodology for the 2020 Regional Growth Forecast was adopted in 2019 and Plan Bay Area 2050 is expected to be adopted in Summer 2021.

11 Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2050, Environmental Review Information, *https://www.planbayarea.org/2050-plan/draft-environmental-impact-report*, accessed May 26, 2021.

12 U.S. Census Bureau, San Francisco County, California, Population and Housing Unit Estimates - QuickFacts San Francisco County, California, 2010-2019, *https://www.census.gov/quickfacts/sanfranciscocountycalifornia*, accessed May 7, 2021.

1,169,485 people in 2040 (an increase of 360,340 people between 2010 and 2040).[13] Plan Bay Area 2040 also projects 872,510 jobs in 2040 (an increase of 295,660 jobs between 2010 and 2040) in San Francisco. Compared to Plan Bay Area 2040, Plan Bay Area (2013) includes a more granular projection of population growth (i.e., at the neighborhood scale for purposes of designating PDAs). Plan Bay Area (2013) anticipated population and jobs growth in the Eastern Neighborhoods PDA, which is where the project site is located. Population growth projections for the Eastern Neighborhoods PDA anticipates 104,880 persons in 2040 (an increase of 31,060 persons over 2010),[14] 43,820 households in 2040 (an increase of 12,170 households over 2010), and 70,890 jobs in 2040 (an increase of 9,820 jobs over 2010).[15] As such, the proposed project or project variants would be implemented in an area where new population and jobs growth is both anticipated and encouraged.

Based on the average household size in the City and County of San Francisco of 2.36 people per household,[16] the addition of 575 new residential units would add approximately 1,357 residents to the citywide population (see Table 1: Existing and Proposed Population and Employment Estimates). This would represent a residential population increase of approximately 0.15 percent citywide over 2019. Additionally, this would represent between approximately 0.38 and 0.42 percent of the population and household growth expected in the City between 2010 and 2040 (360,340 persons and 137,855 households). The 575 additional housing units would also represent between approximately 4.3 and 4.7 percent of the projected population and household growth in the Eastern Neighborhoods PDA between 2010 and 2040 (31,060 persons and 12,170 households). Overall, the proposed project's or project variants' 575 residential units would represent a small fraction of the expected increase in population and households in the Eastern Neighborhoods PDA and citywide, as projected in Plan Bay Area (2013) and Plan Bay 2040. Therefore, the proposed project or project variants would not induce unplanned population growth; rather, it would provide housing units to accommodate the need for housing within the City.

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[13] MTC and ABAG, Projections 2040 by Jurisdiction (Curated), updated May 2019, *http://projections.planbayarea.org/*, accessed March 21, 2021. ABAG and MTC provide this dataset as part of *Projections 2040: A Companion to Play Bay Area 2040* (November 2018), *http://mtcmedia.s3.amazonaws.com/files/Projections_2040-ABAG-MTC-web.pdf*, accessed March 21, 2021.

[14] At the time Projections 2013 were developed the persons per household factor in San Francisco was 2.32.

[15] MTC and ABAG, Plan Bay Area Final Forecast of Jobs, Population and Housing, Appendix B: Housing Growth by Jurisdiction and PDA, July 2013, p. 58, *http://files.mtc.ca.gov/library/pub/28450.pdf*, accessed April 13, 2020.

[16] U.S. Census Bureau. San Francisco County, California, Families and Living Arrangements, Persons per households, 2015-2019, *https://www.census.gov/quickfacts/sanfranciscocountycalifornia*, accessed May 18, 2021.

Table 1: Existing and Proposed Population and Employment Estimates

	Existing	Generation Rate Factors	Proposed Project Estimates
Population			
Total Residential Population	0	2.36 persons/household	1,357 residents
Employment			
Transit Facility	400	NA	829 employees
Commercial	0	350 gsf/employee	95 employees
Residential	0	1 employee/25 units	23 employees
Open Space	0	0.26 employees/acre	1 employee
Total Employment	***400***		***948 Employees***

Notes:

U.S. Census Bureau, San Francisco County, California, Families and Living Arrangements, Persons per households, 2015-2019, *https://www.census.gov/quickfacts/sanfranciscocountycalifornia,* accessed May 18, 2021 (575 residential units × 2.36 persons/household = 1,357 residents).

San Francisco Planning Department, Transportation Impact Analysis Guidelines for Environmental Review, 2002, Appendix C, Table C-1. The estimated number of employees for commercial use assumes an average of 1 employee per 350 gross square feet of retail (33,000 square feet of retail ÷ 350 = 95 employees).

Employment numbers for residential and open space uses were determined using Table III.C-7, p. III.C-12, from the San Francisco Planning Department's Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, November 2009.

For purposes of analysis, the increase in transit facility employees (from 400 to 829) is considered an increase in new employees. Therefore 429 transit facility employees (829 – 400 = 429) are considered new transit facility employees.

The increase in local population from the proposed project or project variants would not be considered substantial unplanned growth unless the physical changes that would be needed to accommodate project-related population growth would have adverse impacts on the physical environment. As evaluated under other environmental topics in this initial study, such as sections E.12 Recreation, E.13 Utilities and Service Systems, and E.14 Public Services, the proposed project or project variants would not require the expansion of roads, or other public infrastructure related to energy, water supply or wastewater/stormwater collection and conveyance system expansions. Additionally, the proposed project or project variants would not require an increase in public services that would cause additional offsite physical changes to the environment. Furthermore, the project is located in the Eastern Neighborhoods PDA and would conform with allowable densities under the planning code through the special use district development process. Infrastructure upgrades necessary to support the proposed project or project variants would be sized to meet only project needs and would not enable additional development. Since the project site is located on an infill site in an established urban neighborhood with available access to necessary infrastructure and services (transportation, utilities, schools, parks, hospitals, etc.), it would not indirectly induce substantial unplanned population growth in the project area.

The transit components of the proposed project or project variants would not directly induce population growth. As part of the SFMTA's Building Progress Program, the replacement transit facility is one of the outcomes from the agency's comprehensive outreach to SFMTA staff and stakeholders (see EIR Chapter 2, Project Description, pp. 2.14-2.17). The SFMTA's planning process is part of an integrated approach premised on transit fleet plan projections developed in coordination with ABAG's regional economic, land use, and population projections for 2040 and the San Francisco County Transportation Authority's travel demand model for the City.[17]

[17] SFMTA, 2014 SFMTA Transit Fleet Management Plan, March 2014, pp. 3-4.

Therefore, the proposed project's or project variants' estimated population growth and the replacement of the transit facility, which would accommodate a portion of Muni's planned transit fleet expansion, would not constitute substantial unplanned growth and no direct or indirect impacts related to population growth would occur.

Employee-Generated Growth

Employment growth, due to the regional distribution of commercial centers, is most appropriately viewed at the citywide scale. In December 2019, there were an estimated 777,100 jobs in San Francisco.[18] In the following analysis, the existing citywide employment is compared to projected employment growth between 2010 and 2040 planned for under ABAG and MTC's Plan Bay Area 2040 and Plan Bay Area (2013) and estimated in Projections 2040: A Companion to Plan Bay Area 2040.

Construction

Project construction is anticipated to occur over a period of three to four years, beginning in 2023. On any given day, there would be an average of 450 construction workers on the site.[19] It is anticipated that construction workers would commute from their residences, and workers who live outside of San Francisco would be expected to commute rather than permanently relocate from more distant locations, which is typical of the construction trades. Once the construction phase is complete, construction workers would typically seek employment at other job sites in the region. Thus, construction of the proposed project or project variants would not result in substantial unplanned employment-generated growth in the City or region.

Operation

Under existing conditions, there are approximately 400 employees associated with the transit facility (approximately 105 onsite employees and 295 trolley bus operators), with up to 158 trolley buses stored and maintained on the trolley bus storage yard. Up to 56 non-revenue vehicles are stored and maintained at Potrero Yard. The number of employees on the site varies throughout the day and night, because each subgroup has its own work hours and shift characteristics.

The proposed project or project variants would include expanded transit facility employment, new commercial employment, and new employment related to the residential and open space land uses, resulting in an estimated onsite employment increase of 548 new employees (from approximately 400 existing employees to 948 total employees) with 829 SFMTA employees and trolley bus operators and 119 employees associated with new commercial and residential uses in the joint development. The expanded transit use would accommodate 213 new buses, with three new bus wash areas, and result in an increase of approximately 429 transit employees on site (from approximately 400 existing employees to 829 total employees) (see Table 1, p. 22).

[18] Employment Development Department, State of California, Current Industry Employment Statistics (Industry Employment) Data, *https://www.labormarketinfo.edd.ca.gov/geography/sanfrancisco-county.html*, accessed May 14, 2021.

[19] Project specific construction information (including estimated number of construction workers) is provided in EIR Appendix G: Air Quality Calculation Details and Supporting Information.

The increase in SFMTA onsite employment of 429 employees would result from the consolidation of employees from other SFMTA offices and new hires. The number of future onsite SFMTA staff is projected to peak at about 180 from noon to 3 p.m. because the greatest number of bus operators are at the site between morning and evening rush hours. During the maximum work shift (9 a.m. – 5 p.m.), there would be approximately 130 to 180 staff on site. Additionally, based on the size of the proposed commercial space, open space, and the number of new residential dwelling units, new employment related to the joint development would be approximately 119 onsite employees. The 548 total new onsite employees represents a 137 percent increase in onsite employment and an increase of less than 0.01 percent over the total number of jobs in San Francisco in 2019.[20] Additionally, the 548 new jobs would represent 0.2 percent of the employment growth projected in Plan Bay Area between 2010 and 2040 for San Francisco, and 5.6 percent of the employment growth projected for the Eastern Neighborhoods PDA over the same period.[21]The proposed project would result in an increase in employees in the Eastern Neighborhoods PDA and citywide.

All the project variants would have the same net increase in employees as the proposed project except for the Employee and Family Support Variant. Under this variant, the proposed 33,000-gross-square-foot ground-floor commercial use would be reduced by 9,000 gross square feet to accommodate a childcare facility, which would include 25 employees. The reduced commercial space (at 24,000 gross square feet) would have 69 employees, 26 fewer commercial employees than the proposed project or other variants.[22] When combined with the 25 employees associated with the childcare use, the 829 employees associated with the transit uses, and the 24 employees associated with the residential use and open space (see Table 1, p. 22), this variant would yield a total employment of 947 employees (an increase of 547 over existing). Therefore, as this variant would support one less employee than the proposed project or other project variants, the analysis and conclusions for the proposed project or other variants would also be applicable to this project variant.

Employee-generated housing demand attributable to the proposed project or project variants would represent 3.4 percent in the Eastern Neighborhoods PDA and 0.3 percent citywide[23] of projected household growth between 2010 and 2040. Such a small increase in demand would not necessitate the construction of new housing and would not constitute substantial unplanned growth. In addition, new onsite employees are likely to be existing residents of the City or the region, and some of the employee-generated housing demand could potentially be

[20] With 548 new onsite employees and 777,100 total jobs in San Francisco in 2019, the new jobs attributable to the proposed project or project variants would be less than 0.01 percent of the total jobs (548 ÷ 777,100 = 0.007 percent).

[21] With 548 new onsite employees and a projected increase of 295,650 jobs in San Francisco between 2010 and 2040, the new jobs are 0.18 percent of the projected growth (548 ÷ 295,650 = 0.18 percent). With 548 new onsite employees and a projected increase of 9,820 jobs in the PDA between 2010 and 2040, the new jobs are 5.58 percent of the projected growth (548 ÷ 9,820 = 5.58 percent).

[22] San Francisco Planning Department, Transportation Impact Analysis Guidelines for Environmental Review, 2002, Appendix C, Table C-1. The estimated number of employees for commercial use assumes an average of 1 employee per 350 gross square feet of retail (24,000 square feet of retail ÷ 350 = 69 employees).

[23] With 548 new onsite employees and 1.32 workers per household (following ABAG's estimate of workers per household in *Projections 2013,* pp. 74 and 75), there would be an increase of approximately 416 households (548 ÷ 1.32), compared to the Plan Bay Area projected increase of 12,120 and 137,885 households in the PDA and San Francisco, respectively, between 2010 and 2040. Therefore, the 416 households would represent 3.4 percent of 12,170 and 0.3 percent of 137,885.

accommodated by housing developed under the proposed project or project variants. Therefore, the proposed project or project variant's employment-generated housing demand, from both new transit facility employees as well as the anticipated new commercial and residential employees (and childcare), would not constitute substantial unplanned employment growth or concentration of employment.

Given the above, the proposed project or project variant's estimated population and employment growth would not constitute substantial unplanned growth and no direct or indirect impacts related to such growth would occur. Mitigation measures are not required. This topic will not be discussed in the EIR.

Impact PH-2: The proposed project or project variants would not displace substantial numbers of existing people or housing units, necessitating the construction of replacement housing. (*Less than Significant*)

The project site is currently developed with the Potrero Yard transit facility, and there are no existing housing units on the project site. As such, no housing units would be displaced by the proposed project or project variants. During construction, the approximately 400 existing employees at the transit facility would continue to be employed by SFMTA and would be relocated to the Muni Metro East Facility, located approximately 1.5 miles southeast of the project site at 601 25th Street near the intersection of 3rd and Cesar Chavez streets, or other SFMTA facilities such as the 1399 Marin Street Facility or the Kirkland, Presidio and Woods bus yards. Therefore, implementation of the proposed project or project variants would have a less-than-significant impact related to the displacement of residents or employees requiring the construction of replacement housing. Thus, no physical environmental effects associated with the construction of replacement housing would occur as a result of implementation of the proposed project or project variants. Therefore, this impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-PH-1: The proposed project or project variants, in combination with cumulative projects in the vicinity and larger geographic areas, would not result in significant cumulative population and housing impacts. (*Less than Significant*)

As discussed above, Plan Bay Area includes housing and employment projections anticipated to occur in San Francisco through 2040 and calls for focused growth and development within PDAs. Plan Bay Area projections provide the cumulative context for the population and housing analysis and are more recent than the population or employment growth projections included in the Eastern Neighborhoods Rezoning and Area Plans Final EIR,[24] which cover an area larger than the geographic extent of the Eastern Neighborhood PDA and do not project into 2040. ABAG's growth projections for San Francisco anticipate 483,695 households in 2040 (an increase of 137,885 households between 2010 and 2040) and 872,510 jobs in 2040 (an increase of 295,660 jobs between 2010 and 2040).[25] Projections for the Eastern Neighborhoods PDA also anticipate population and job growth through

[24] San Francisco Planning Department, Eastern Neighborhoods Rezoning and Area Plans Final EIR, August 7, 2008, pp. 33-34 and p. C&R-19, *https://sfplanning.org/eastern-neighborhoods-plans*, accessed March 26, 2021.

[25] MTC and ABAG, Projections 2040 by Jurisdiction (Curated), updated May 2019, *http://projections.planbayarea.org/*, accessed March 26, 2021.

2040 with 43,820 households in 2040 (an increase of 12,170 households over 2010) and 70,890 jobs in 2040 (an increase of 9,820 jobs over 2010).[26]

In 2019, San Francisco had an estimated population of 881,549 residents, an estimated 406,413 housing units, and approximately 777,100 jobs. The proposed project and cumulative projects would add an additional 992 housing units and 1,741 new jobs.[27,28] As discussed, cumulative household and employment growth is below the Plan Bay Area projections for planned growth in San Francisco and in the Eastern Neighborhoods PDA. Therefore, the proposed project or project variants, in combination with local and citywide development would not result in significant cumulative environmental effects associated with inducing unplanned population growth or displacing substantial numbers of people or housing, necessitating the construction of replacement housing elsewhere. For this reason, cumulative population and housing impacts would be less than significant.

Based on the above, the proposed project or project variants would contribute a small portion of the growth anticipated in the Eastern Neighborhoods PDA as well as for San Francisco as a whole under Plan Bay Area. The proposed project's or project variants' incremental contribution to this anticipated growth would not result in a significant individual or cumulative impact related to population and housing. Mitigation measures are not required. This topic will not be discussed in the EIR.

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[26] MTC and ABAG, Plan Bay Area Final Forecast of Jobs, Population and Housing, Appendix A: Employment Growth by Jurisdiction and PDA, and Appendix B: Housing Growth by Jurisdiction and PDA, July 2013, p. 50, *http://files.mtc.ca.gov/library/pub/28450.pdf*, accessed March 26, 2021.

[27] Employment numbers for residential uses were determined using Table III.C-7, p. III.C-12, from the San Francisco Planning Department, Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, November 2009. With 1 employee per 25 units, and 417 net new units listed in EIR Table 3.A.1, on p. 3.7, 417 ÷ 25 = 17 new employees.

[28] Calculation of the number of new jobs follows San Francisco Planning Department, Transportation Impact Analysis Guidelines for Environmental Review, 2002, Appendix C, Table C-1. The estimated number of new non-residential employees, for the cumulative projects listed in EIR Table 3.A.1 assumes an average of 1 employee per 276 square feet of office use, 1 employee per 567 square feet of manufacturing/industrial, and 1 employee per 350 gross square feet of retail. Calculations are as follows: 210,240 square feet of office ÷ 276 = 762 employees; 221,615 square feet of PDR ÷ 567 = 391; and 7,500 square feet of retail ÷ 350 = 22 employees. Added together (762 + 391 + 22 + 17 [residential]), the total for cumulative projects jobs is 1,193. Proposed project jobs (548) + cumulative projects jobs (1,193) = 1,741 new jobs.

E.4 Cultural Resources

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
4. CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5, including those resources listed in article 10 or article 11 of the San Francisco *Planning Code*?	☒	☐	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐	☐

Summary of Cultural Resources Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. Comments on the NOP received during the NOP scoping period and related to cultural resources expressed concern with the impacts on the existing architectural character of the Muni facility and how retention and rehabilitation of the facility was considered in the project's design (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

Cultural Resources

Historic Architectural Resources

See EIR Section 3.B, Historic Architectural Resources, for the project-specific and cumulative analysis related to historic architectural resources.

Archeological Resources and Human Remains

As stated in Section D, Summary of Environmental Effects, p. 11, and EIR Chapter 2, Project Description, pp. 2.49-2.54, the proposed project or project variants would be subject to public works' SCMs. SCM #9, Cultural Resources, for archeological and historic (built environment) resources establishes procedures for public works projects with related ground disturbance that exceeds any previous depth of ground disturbance or proposed ground disturbance within previously undisturbed areas, in which cases additional screening will be carried out (see EIR Appendix C). SCM #9 includes an archeological assessment process for archeological resources that requires public works to coordinate with a planning department archeologist to complete the preliminary archeological assessment (see Attachment D in EIR Appendix C).

Based on the results of this assessment, the archeologist recommends whether and which of the following measures should be implemented during construction to avoid potential impacts to archeological resources:

- Public Works Archeological Measure I (Archeological Discovery);
- Public Works Archeological Measure II (Archeological Monitoring); and
- Public Works Archeological Measure III (Archeological Testing/Data Recovery).

Through implementation of applicable measures, significant impacts to identified and as-yet unidentified archeological resources and human remains would be avoided (see EIR Appendix C, Attachments F through H).

Impact CR-1: Construction excavation for the proposed project or project variants would not cause a substantial adverse change in the significance of an archeological resource because the requirements of San Francisco Public Works Standard Construction Measures are part of the project. (*Less than Significant*)

This section discusses archeological resources, both as historical resources according to CEQA Guidelines section 15064.5, as well as unique archeological resources as defined in CEQA section 21083.2(g). Determining the potential for encountering prehistoric or historical archeological resources includes relevant factors such as the location, depth, and amount of excavation proposed as well as any recorded information on known resources in the area.

To determine the potential for the proposed project or project variants to affect prehistoric or historical archeological resources, the planning department conducted a Preliminary Archeological Review (PAR) of the project site as required under public works' SCM #9 (see Archeological Assessment Process).[29] The following information is based on the PAR prepared by the planning department, which included review of the geotechnical report prepared by ARUP/RYCG.[30]

Construction of the proposed project or project variants would require excavation to a depth of up to 35 feet below present surface grade within the parcel across the whole site to accommodate one full basement level, foundation work, elevator pits, and lower-level work areas for SFMTA maintenance staff. In addition, pile driving would be required up to approximately 85 feet below grade to support the foundation on the western half of the site. Approximately 248,900 cubic yards of soil would be removed from the project site.

There are no prehistoric archeological sites recorded within the project area or within a 0.25-mile radius surrounding the project site. In San Francisco, the majority of recorded prehistoric archeological sites are within approximately 2,500 feet (less than 0.5 mile) of the historic bay margin. The project site is located approximately 1.2 miles from the San Francisco shoreline. Sensitivity for prehistoric archeological sites generally diminishes significantly in areas further than 0.5 mile from the shore but is increased along creeks and around water bodies more distant from the

[29] San Francisco Planning Department, Environmental Review Preliminary Archeological Review for Potrero Yard at 2500 Mariposa Street, Case File No. 2019-021884ENV, April 2, 2020 (includes confidential archaeological data, and thus is not subject to FOIA or Sunshine Ordinance).

[30] Arup/RYCG Joint Venture, Geotechnical Engineering Report, San Francisco Public Works, SFMTA Potrero Facility Rebuild, November 2019 (hereinafter referred to as "Geotechnical Report").

shore. GIS-based prehistoric sensitivity modeling[31], which takes into account proximity to other water sources and topography, as well as distance from the bay, ranks the western half of the project site as having high sensitivity for near-surface prehistoric resources, while the eastern half of the site is ranked as having moderate sensitivity.

Soils and bedrock underlying the project site would be disturbed by project grading and excavation. Based on geotechnical borehole data,[32] the soil profile varies significantly across the project site. The upper surface of the Colma Formation, which was formed too early in time to have the potential to include prehistoric resources except very near its surface, is present at depths of 5 to 14 feet below present parcel grade. The Colma Formation (and, variably, bedrock) at the site are overlain by clayey sand, and by an uppermost layer of fill or disturbed native soil that ranges from 1 to 6 feet thick, as observed on geotechnical cores. Weathered bedrock is present near the ground surface in the northeast corner of the site and dips steeply towards the southwest corner of the site (Mariposa and Bryant streets) where it is approximately 69 feet below ground surface. Based on this geomorphology, prehistoric archeological sensitivity varies in different parts of the site but extends generally from near the surface to no more than about 15 feet below the surface.

With respect to historic-period archeological resources, the PAR reports that the general project area was initially developed in the late 19th Century, with some residential development on the north and western portions of the site from the 1880s into the second decade of the 20th Century. The parcels remained in a semi-rural condition until construction of the original Potrero Trolley Coach Division maintenance/operations facility in 1915 on the eastern parcel. Expansions and/or modifications of this facility occurred in 1924-1925, 1940-1941, and again in 1948-1949. The 1940-1941 expansions/modifications included the purchase and occupation of the northern portion of the western parcel along 17th Street west of York Street by the San Francisco Municipal Railway (Muni) in anticipation of the shift away from street cars to trolley coaches and the need for additional space for trolley coach storage.[33] The 1948-1949 expansions/modifications resulted in structural changes to the maintenance/operations facility as part of the conversion from a streetcar facility to trolley coach facility, and the development of the bus storage yard on the western half of the site, which entailed the demolition of the existing structures near 17th Street and the Muni corporation yard on Mariposa Street.

Most significant with respect to the potential for the survival of historic-period archeological resources is that the natural topography of the site (a generally northeast-to-southwest trending slope) was altered substantially by the construction of the original transit facility in 1915. At that time, a bench approximately 20 feet deep was blasted out of the bedrock on the northeast portion of site to create a predominantly level site. This blasting/excavation undoubtedly destroyed any 19th-Century features and prehistoric deposits that may have been present on that

[31] Far Western Anthropological Research Group Citywide Archeological Sensitivity Model June 2019. Confidential document on file with the planning department's environmental planning division.

[32] Arup/RYCG Joint Venture, Geotechnical Engineering Report, San Francisco Public Works, SFMTA Potrero Facility Rebuild, November 2019.

[33] This property contained a large Victorian farmhouse and several rural outbuildings (see PAR, p. 7, and EIR Appendix D-1, HRE, p. 47).

portion of the project site. The potential for 19th-Century features and prehistoric deposits to survive is limited primarily to the western half of the site.

Although there are no recorded prehistoric sites in the project vicinity, prehistoric and late 19th-Century historic archeological deposits or features could be present and could be adversely affected by project excavation activities. Ground-disturbing construction activity within the western half and possibly southeastern portions of the project site could destroy or adversely affect the significance of prehistoric or historical archeological resources, should any such resources be present.

Accordingly, department staff archeologists have evaluated the project and have concluded that it is subject to each of the Public Works Archeological Measures. The Public Works Archeological Measures would be incorporated into the proposed project or project variants to avoid potentially significant impacts to significant prehistoric or historical archeological resources. Certain elements of SCM #9 have been completed such as the preliminary archeological review required under Public Works Archeological Measure III.A, listed below.

Public Works Archeological Measure I (Archeological Discovery)

The following requirements are applicable to:

- All projects that will include soil disturbance,
- Any discovery of a potential historical resource or of human remains, with or without an archeological monitor present.

Prior to ground disturbing activities:

A. Alert Sheet. Public Works shall, prior to any soils disturbing activities, distribute the Planning Department archeological resource "ALERT" sheet to each project contractor or vendor involved in project-related soils disturbing activities; ensure that each contractor circulates it to all field personnel; and provide the Environmental Review Officer (ERO) with a signed affidavit from each contractor confirming distribution to all field personnel.

Upon making a discovery:

B. Work Suspension. Should a potential archeological resource be encountered during project soils disturbing activity, with or without an archeological monitor present, the project Head Foreman shall immediately suspend soils-disturbing activities within 50 feet (15 meters) of the discovery in order to protect the find from further disturbance, and notify the Public Works Project Manager (PM) and/or environmental planning staff, who shall immediately notify the ERO for further consultation.

C. Qualified Archeologist. All archeological work conducted under this measure shall be performed by an archeologist who meets the Secretary of the Interior's Professional Qualifications Standards (36 CFR 61); consultants will be selected in consultation with the ERO and meeting the criteria or specialization required for the resource type as identified by the ERO in a manner consistent with Public Works on-call contracting requirements.

D. Assessment and Additional Measures. If the ERO determines that the discovery is a potential archeological/historical resource, the archeologist, in consultation with the ERO, shall document the find, evaluate based on available information whether it qualifies as a significant historical resource under the CEQA criteria, and provide recommendations for additional treatment as warranted. The ERO will consult with Public Works and the qualified archeologist on these recommendations and may require implementation of

additional measures as set forth below in Archeological Measures II and III, such as preparation and implementation of an Archeological Monitoring Plan, an Archeological Testing Plan, and/or an Archeological Data Recovery Plan, and including associated research designs, descendant group consultation, other reporting, curation, and public interpretation of results.

E. Report Reviews. All plans and reports prepared by an archeological consultant, as specified herein, shall be submitted first and directly to the ERO for review and comment with a copy to the Public Works and shall be considered draft reports subject to revision until final approval by the ERO.

F. Draft and Final Archeological Resources Reports. For projects in which a significant archeological resource is encountered and treated during project implementation (see Archeological Measures II and III), the archeological consultant shall submit a draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken, research questions addressed, and research results. Information that may put at risk any archeological resource shall be provided in a separate, removable insert within the draft final report.

Once approved by the ERO, copies of the FARR shall be distributed as follows: two copies to the applicable California Historic Information System Information Center (CHRIS), one copy to each descendant group involved in the project, and documentation to the San Francisco Planning Department of transmittal of the above copies. In addition, the Planning Department shall be provided one bound, one unbound and one unlocked, searchable PDF copy on CD of the FARR, which shall include copies of any formal site recordation forms (CA DPR 523 series) and/or National Register of Historic Places/California Register of Historical Resources nominations.

G. Other Reports. In instances of high public interest or interpretive value, the ERO may require different or additional final report content, format, and distribution than that presented above.

H. Human Remains, Associated or Unassociated Funerary Objects. Public Works shall ensure that human remains and associated or unassociated funerary objects discovered during any soils disturbing activity are treated in compliance with applicable State and federal laws. In the event of the discovery of potential human remains, the construction contractor shall ensure that construction activity within 50 feet of the find is halted and the Public Works PM, ERO, and the County Coroner are notified immediately. If the Coroner determines that the remains are of Native American origin, he/she will notify the California State Native American Heritage Commission. Subsequent consultation on and treatment of the remains shall be conducted consistent with Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.S(d), in consultation with the ERO.

I. Consultation with Descendant Communities. Consistent with AB 52 requirements, if requested, Public Works shall provide opportunities for Native American descendant groups to provide input during project planning for projects that may affect potential Tribal Cultural Resources. In addition, on discovery during construction of an archeological site associated with descendant Native Americans, the Overseas Chinese, or other descendant group, an appropriate representative of the descendant group shall be contacted by Public Works at the direction of the ERO. Public Works will offer this representative the opportunity to monitor archeological field investigations of the site and to consult with the ERO regarding the appropriate treatment and, if applicable, interpretation of the site and the recovered materials.

J. Construction Delays. Archeological monitoring and/or data recovery programs required by this measure may suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if this is the only feasible means to reduce potential effects on a significant archeological find to a less-than-significant level.

Public Works Archeological Measure II (Archeological Monitoring)

A. Archeological Monitoring Plan (AMP). Where an archeological field investigation to identify expected buried or submerged resources cannot reasonably be carried out during project planning/ environmental review (for example, where definitive determination would require extensive street opening prior to construction), prior to any project-related soils--disturbing activities the qualified archeologist identified under Archeological Measure I.C. shall consult with Public Works and the ERO to develop an Archeological Monitoring Plan (AMP). The AMP which will be implemented in conjunction with soil-disturbing activities during construction. Preparation and implementation of an AMP also may be required based on the results of pre-construction archeological testing or upon a discovery during construction.

The AMP shall include the following elements, at minimum:

- Historical context and research design for assessment of resource types likely to be encountered;
- Project activities to be archeologically monitored and intensity of monitoring of each type and location of project construction activity; and
- Procedures for the documentation, significance and integrity assessment, treatment, interpretation and reporting of the types of resources likely to be encountered.

B. Reporting. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO at the end of construction (See Archeological Measure I.E [Report Reviews] and I.F. [Draft and Final Archeological Research Report].)

C. Monitoring Authorities

- The archeological monitor will have the authority to halt construction activity at the location of a suspected resource for inspection, documentation, and assessment of the need for further measures as set forth in Archeological Measure III.
- The Archeological Monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis.
- The Archeological Monitor(s) shall be present on the project site according to a schedule identified in the AMP, subject to modification upon ERO concurrence, based on findings.

D. Testing/Data Recovery. In the event of a discovery during construction, if the ERO and archeological consultant determine that the discovery is a significant resource (that is, a resource that meets the eligibility criteria of the California Register of Historic Resources or qualifies as a unique archeological resource) that will be adversely affected (that is, where the project would result in loss of data potential) or that additional investigation is required to make this determination, all applicable elements of Archeological Measure III (Archeological Testing/Data Recovery) also shall be implemented.

Public Works Archeological Measure III (Testing/Data Recovery)

The following provisions apply prior to or during construction when a significant archeological resource (as defined in Measure II.D) or an archeological resource of undetermined significance is expected to be present in the work area and the ERO, in consultation with the qualified archeologist, determines that an archeological field investigation is needed to determine: a) the presence of an archeological resource, b) whether it retains depositional integrity, and c) whether it qualifies as a legally significant resource under CEQA criteria. All archeological work under this Measure will be carried out by a qualified archeologist as identified in Archeological Measure I.C. Per Archeological Measure I.J, implementation of this measure shall not exceed four

weeks except at the direction of the ERO and only if this is the only feasible means to reduce potential effects on a significant archeological find to a less-than-significant level.

A. Archeological Testing Program. If an archeological investigation is required in order to verify resource location and/or assess the significance of the resource, the archeological consultant shall consult with the ERO to prepare and implement an Archeological Testing Plan (ATP) that identifies:

   - Key research questions and associated data needs,
   - Testing/ sampling methods, and
   - Testing locations.

   Results of testing shall be presented to the ERO in a written report following Measure I.E. If, based on the archeological testing program, the archeological consultant finds and the ERO concurs that significant archeological resources may be present, Measures III.B and/or III.C below will be implemented.

B. Treatment. If the project could adversely affect a significant (CRHR-eligible) archeological resource, preservation in place is the preferred manner of mitigating impacts, as detailed in CEQA Guidelines 15126.6(b) (3)(a) and (b).

   If preservation in place is determined to be infeasible, the Public Works at its discretion shall either:

   - Re-design the proposed project so as to reduce the adverse effect to a less-than-significant level through preservation in place or other feasible measures; and/or
   - For a resource important for its association with an important event or person, or which is of demonstrable public interest for both its scientific and historical values (e.g., a submerged ship), and where feasible, preserve the resource in place with appropriate documentation; or, if not feasible to preserve in place, systematically document and/or recover for interpretive use, at the discretion of the ERO; and/or
   - For an archeological resource significant primarily for its data potential, design and implement an archeological data recovery program, as detailed under Measure III.D.

C. Archeological Data Recovery Plan (ADRP). For resources for which the elected treatment is archeological data recovery, the archeological consultant, in consultation with the ERO, shall prepare and implement an ADRP. It will identify how the significant information the archeological resource is expected to contain will be recovered and preserved. Data recovery results will be reported in the Final Archeological Resources Report (FARR), as detailed in Measure I.F. The ADRP shall include the following elements:

   - Historic context and research design
   - Field methods and procedures, including sampling strategy
   - Archeological monitoring recommendations for ongoing construction
   - Cataloguing and laboratory analysis
   - Discard, deaccession, and curation policy
   - Interpretive program
   - Security measures

With the incorporation of the Public Works Archeological Measures in the proposed project or project variants, any archeological resource that may be present on the project site would be promptly discovered through archeological discovery provisions implemented during construction, as needed. If a significant resource is discovered that cannot

be preserved in place, archeological data recovery and the other elements of the Public Works Archeological Measures (archeological monitoring and archeological testing) would be implemented to preserve and realize the information potential of archeological resources. With the incorporation in the project of all the Public Works Archeological Measures, the proposed project or project variants would not cause a substantial adverse change to the significance of an archeological resource, because resources that may be present would be promptly discovered with minimal disturbance, and archeological monitoring and data recovery would be implemented to ensure that the significant information they represent is preserved. Therefore, this impact would be less than significant.

Impact CR-2: Construction excavation for the proposed project or project variants could disturb human remains, if such remains are present within the project site. (*Less than Significant*)

There is the potential for Native American or other human remains to be present at the project site, either in the context of an archeological site or in isolation. Excavations for the proposed project or project variants may disturb human remains, if such resources are present within the project site, which is a potentially significant impact.

Because the proposed project or project variants would include soil disturbance, Public Works Archeological Measure I (Archeological Discovery) would be implemented prior to ground disturbance, requiring the distribution of "ALERT" sheets to all construction contractors involved in soils-disturbing activities, return of signed affidavits by construction contractors, and work suspension when a potential archaeological resource is encountered. Pre-construction archeological testing under Public Works Archeological Measure III.A would seek to identify archeological sites, including those that might include human remains. Public Works Archeological Measure II and Public Works Archeological Measure I.H also include provisions for archeological monitoring during construction and for identifying and addressing human remains that might be encountered, respectively. In addition, applicable state and federal laws and the protocols regarding the treatment of human remains, including California Health and Safety Code Section 7050.5, require that if human remains are encountered, ground-disturbing work in the immediate area of the find must be halted, and arrangements made to protect the remains in place until they have been inspected by the County Coroner (in San Francisco, the Medical Examiner). If the Medical Examiner determines the remains to be Native American, the Medical Examiner will notify the Native American Heritage Commission, who will appoint an Ohlone Most Likely Descendant to inspect the remains and provide recommendation for subsequent treatment. If the remains cannot be permanently protected in place, treatment may include archeological recovery and analysis followed by respectful reburial, as set forth in Public Works Archeological Measure III.

Public Works Archeological Measure III, which would be incorporated in the proposed project or project variants, would ensure that human remains, if present within the project site, would be promptly identified and appropriately treated. Therefore, the potential impact on human remains would be less than significant.

Cumulative Impacts

Impact C-CR-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative impacts on as-yet unknown archeological resources or human remains. (*Less than Significant*)

Ground-disturbing activities for construction of the proposed project or project variants have the potential to disturb as-yet unknown archeological resources and human remains. However, impacts to archeological resources and human remains are site-specific; that is, an archeological resource or associated or unassociated human remains would be affected by cumulative projects only if they extend onto more than one project site or would be affected by more than one episode of development. Although cumulative projects could require various levels of excavation and grading, which may affect archeological resources or human remains, there are no adjacent projects that could combine with the proposed project or project variants. There are no known archeological resources or human remains on the project site that have been affected or would be affected by the cumulative projects. On this basis, the potential for significant cumulative impacts on archeological resources and/or human remains would be less than significant. Further, the proposed project or project variants would incorporate all Public Works Archeological Measures including Public Works Archeological Measure III, which would ensure that the proposed project or project variants would not contribute to any potentially significant cumulative impacts on archeological resources and/or human remains. As such, this topic will not be discussed in the EIR.

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E.5 Tribal Cultural Resources

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
5. TRIBAL CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☒	☐	☐	☐
ii. A resource determined by the lead agency in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in this subdivision, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐	☐

Summary of Tribal Cultural Resources Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. Comments on the NOP received during the NOP scoping period and related to tribal cultural resources requested that all procedures required for evaluating the potential for discovering and then preserving potential resources be followed (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

Impact TCR-1: Construction of the proposed project or project variants could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074. (*Less than Significant with Mitigation*)

CEQA section 21074.2 requires the CEQA lead agency to consider the effects of a project on tribal cultural resources. As defined in CEQA section 21074, tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe and that are listed, or determined to be eligible for listing, on a national, state, or local register of historical resources. Pursuant to CEQA section 21080.3.1, on February 1, 2021, the planning department contacted Native American individuals and organizations identified

by the Native American Heritage Commission for the San Francisco area, providing a description of the project and requesting comments on the identification, presence, and significance of tribal cultural resources in the project vicinity. During the 30-day comment period, Native American tribes contacted in the planning department outreach process did not request consultation. On this basis there are no known tribal cultural resources on the project site.

However, as discussed above under Impact CR-1 in initial study Section E.4, Cultural Resources, preliminary archeological review by a planning staff archeologist determined that the project site is highly to moderately sensitive for prehistoric archeological resources and that unknown prehistoric archeological deposits could be present on the western portion of the site and could be encountered during project excavations.[34] In 2015, the planning department, after consultation with Ohlone Native American tribes, concluded that all Native American archeological sites in San Francisco should be considered to be potential tribal cultural resources. Preliminary archeological review determined that significant prehistoric archeological resources could be encountered during construction. Therefore, the proposed project or project variants also have the potential to encounter tribal cultural resources during excavation and other soil-disturbing construction activities. Any damage to tribal cultural resources would be considered a significant impact. Based on prior planning department Native American consultation under Assembly Bill 52, local Ohlones indicated that their preferred treatment of tribal cultural resources is preservation in place. If preservation in place is not feasible, then archeological data recovery should be carried out, and public interpretation of the find should be planned and implemented in consultation with the local tribes.

As discussed above, the proposed project or project variants would incorporate Public Works Archeological Measure III, which provides for both pre-construction archeological testing and archeological data recovery. The implementation of this measure would ensure that if a tribal cultural resource is present and cannot be preserved in place, appropriate archeological data recovery would be implemented. In addition, Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation and/or Interpretive Program would be implemented to reduce impacts to tribal cultural resources that could be encountered during construction activities to less-than-significant levels. This would be achieved by preserving the resource in place, if feasible (the Native American preference and the preferred treatment under CEQA) or, if not feasible, by implementing archeological data recovery and developing and implementing a public interpretive program in consultation with local Native American representatives, as detailed below.

Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation and/or Interpretive Program

During ground-disturbing activities that encounter archeological resources, if the Environmental Review Officer (ERO) determines that a significant archeological resource is present, and if in consultation with the affiliated Native American tribal representatives, the ERO determines that the resource constitutes a tribal cultural resource (TCR) and that the resource could be adversely affected by the proposed project, the proposed project shall be redesigned so as to avoid any adverse effect on the significant tribal cultural resource, if feasible.

If the ERO, in consultation with the project sponsor, determines that preservation-in-place of the TCR would be both feasible and effective, then the archeological consultant shall prepare an archeological resource

[34] San Francisco Planning Department, Environmental Review Preliminary Archeological Review for Potrero Yard at 2500 Mariposa Street, Case File No. 2019-021884ENV, April 2, 2020.

preservation plan (ARPP). Implementation of the approved ARPP by the archeological consultant shall be required when feasible.

If the ERO, in consultation with the affiliated Native American tribal representatives and the project sponsor, determines that preservation-in-place of the TCR is not a sufficient or feasible option, then the project sponsor shall implement an interpretive program of the TCR in consultation with affiliated Native American tribal representatives. An interpretive plan produced in consultation with affiliated Native American tribal representatives, at a minimum, and approved by the ERO, would be required to guide the interpretive program. The plan shall identify proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, artifacts displays and interpretation, and educational panels or other informational displays.

The inclusion of Public Works Archeological Measure III in the proposed project or project variants and implementation of Mitigation Measure M-TCR-1 would mitigate the potential for tribal cultural resources impacts of the proposed project or project variants to a less-than-significant level by preserving the resource or, if preservation in place proves infeasible, by preserving the significant information and values represented by the resource and, with Native American collaboration, interpreting it to the public. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-TCR-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative tribal cultural resources impacts. (*Less than Significant with Mitigation*)

As discussed above under Impact C-CR-1, p. 35, cumulative projects could require various levels of excavation and grading, which may affect prehistoric archeological resources, which are also considered potential tribal cultural resources. Project-related impacts on tribal cultural resources are site-specific and generally limited to a project's construction area. As noted, there are no adjacent cumulative projects with impacts that could combine with the impacts of the proposed project. There are no known tribal cultural resources on the project site and the proposed project or project variants would not affect any known resources that have been or would be affected by the cumulative projects. On this basis, the potential for significant cumulative impacts on tribal cultural resources would be less than significant. Further, inclusion of Public Works Archeological Measure III in the proposed project or project variants and implementation of Mitigation Measure M-TCR-1 would ensure that the proposed project or project variants would not contribute to any potentially significant cumulative impacts. Tribal cultural resources will not be discussed in the EIR.

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E.6 Transportation and Circulation

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
6. TRANSPORTATION AND CIRCULATION. Would the project:					
a) Involve construction that would require a substantially extended duration or intensive activity, the effects of which would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations; or interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit?	☒	☐	☐	☐	☐
b) Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations?	☒	☐	☐	☐	☐
c) Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access?	☒	☐	☐	☐	☐
d) Substantially delay public transit?	☒	☐	☐	☐	☐
e) Cause substantial additional vehicle miles travelled or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network?	☒	☐	☐	☐	☐
f) Result in a loading deficit, the secondary effects of which would create potentially hazardous conditions for people walking, bicycling, or driving; or substantially delay public transit?	☒	☐	☐	☐	☐
g) Result in a substantial vehicular parking deficit, the secondary effects of which would create potentially hazardous conditions for people walking, bicycling, or driving; or interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; or substantially delay public transit?	☒	☐	☐	☐	☐

EIR Section 3.C, Transportation and Circulation, provides a detailed analysis of construction and operational transportation and circulation impacts associated with the proposed project or project variants, including an explanation of initial study checklist topics E.6(a) through E.6(g) indicated above. The EIR includes a complete description of the existing transportation and circulation setting and regulatory framework, the approach to the analysis, an impact evaluation of the proposed project and its variants, cumulative impacts, and, if appropriate, identification of mitigation measures. The significance of the proposed project's or project variants' transportation and circulation effects is based on detailed travel demand estimates, intersection counts, and site observations.

On September 27, 2013, Governor Brown signed Senate Bill 743, which became effective on January 1, 2014, and amended CEQA by adding section 21099 regarding analysis of aesthetics and parking impacts for urban infill projects. Key provisions of CEQA section 21099(d) include changing the analysis of aesthetics and parking impacts for urban infill projects pursuant to CEQA. The proposed project or project variants would include an expanded transit use and a new mixed-use component (residential and commercial) that meets the definition of an employment center and is located on an infill site in a transit priority area, as discussed above under Section E.2, Aesthetics. Accordingly, parking impacts can no longer be considered in determining the significance of the proposed project's or project variants' physical environmental effects under CEQA. However, this EIR has also considered any secondary physical impacts associated with constrained parking supply (e.g., queuing by drivers waiting for scarce onsite parking spaces that may affect the public right-of-way) as applicable in the analyses.

E.7 Noise

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
7. NOISE. Would the project:					
a) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐	☐
b) Generate excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☐	☒

EIR Section 3.D, Noise, provides a detailed analysis of construction and operation noise and vibration impacts associated with the proposed project or project variants, including explanation of initial study checklist topics E.7(a) and E.7(b) indicated above. The EIR includes a complete description of the existing noise setting and regulatory framework, the approach to the analysis, an impact evaluation of the proposed project and its variants, and cumulative impacts, and, if appropriate, identification of mitigation measures. The project site is not located within an area covered by an airport land use plan, within 2 miles of a public airport or a public use airport, or in the vicinity of a private airstrip. Therefore, initial study checklist topic E.7(c) is not applicable to the proposed project or project variants and is not addressed further. The significance of the proposed project's or project variants' noise effects is based on detailed noise measurements, modeling, and calculations.

E.8 Air Quality

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
8. AIR QUALITY. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard?	☒	☐	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐	☐

EIR Section 3.E, Air Quality, provides a detailed analysis of construction and operation air quality impacts associated with the proposed project or project variants, including explanation of initial study checklist topics E.8(a) through E.8(d) indicated above. The EIR includes a complete description of the existing air quality setting and regulatory framework, the approach to the analysis, an impact evaluation of the proposed project and its variants and cumulative impacts, and, if appropriate, identification of mitigation measures. The significance of the proposed project's or project variants' local and regional air quality effects is based on detailed air quality study modeling and a health risk assessment.

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E.9 Greenhouse Gas Emissions

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
9. GREENHOUSE GAS EMISSIONS. Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	☐
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	☐

Summary of Greenhouse Gas Emissions Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to greenhouse gas emissions (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Cumulative Impacts

Greenhouse gas (GHG) emissions and global climate change represent cumulative impacts. GHG emissions cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature; instead, the combination of GHG emissions from past, present, and future projects has contributed and will continue to contribute to global climate change and its associated environmental impacts.

The Bay Area Air Quality Management District (air district) has prepared guidelines and methodologies for analyzing GHGs. These guidelines are consistent with CEQA Guidelines sections 15064.4 and 15183.5, which address the analysis and determination of significant impacts from a proposed project's GHG emissions. CEQA Guidelines section 15064.4 allows lead agencies to rely on a qualitative analysis to describe GHG emissions resulting from a project. CEQA Guidelines section 15183.5 allows for public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of GHGs and describes the required contents of such a plan. Accordingly, San Francisco has prepared Strategies to Address Greenhouse Gas Emissions,[35] which presents a comprehensive assessment of policies, programs, and ordinances that collectively represent San Francisco's qualified GHG reduction strategy in compliance with the CEQA Guidelines. These GHG reduction actions have resulted in a 35 percent reduction in GHG emissions in 2018 compared to 1990 levels[36], exceeding the year 2020 reduction goals

[35] San Francisco Planning Department, 2017 Greenhouse Gas Reduction Strategy Update, July 2017, *https://sfplanning.org/project/greenhouse-gas-reduction-strategies#info*, accessed March 26, 2021.

[36] San Francisco Department of the Environment, San Francisco's Carbon Footprint, 2019, *https://sfenvironment.org/carbon-footprint*, accessed March 26, 2021.

outlined in the air district's Bay Area 2017 Clean Air Plan (2017 Clean Air Plan), Executive Order (EO) S-3-05, and Assembly Bill (AB) 32 (also known as the Global Warming Solutions Act).[37]

Given that the City has met the state and region's 2020 GHG reduction targets and San Francisco's GHG reduction goals are consistent with, or more aggressive than, the long-term goals established under EO S-3-05,[38] EO B-30-15,[39,40] and Senate Bill (SB) 32,[41,42] the City's GHG reduction goals are consistent with EO S-3-05, EO B-30-15, AB 32, SB 32, and the 2017 Clean Air Plan. Therefore, projects that would be consistent with the City's GHG reduction strategy would also be consistent with the GHG reduction goals, would not conflict with these plans or result in significant GHG emissions, and would therefore not exceed San Francisco's applicable GHG threshold of significance.

The following analysis of the proposed project's impact on climate change focuses on the proposed project's contribution to cumulatively significant GHG emissions. Because no individual project could emit GHGs at a level that could result in a significant impact on the global climate, this analysis is in a cumulative context, and this section does not include an individual project-specific impact statement.

The proposed project or project variants would include public transit (municipal) and private residential and commercial components. Because the project would be developed as a single integrated structure, as proposed, and the site would remain City-owned property through the SFMTA, the project would be a public project. Therefore, the project was reviewed against the San Francisco Planning Department's Compliance Checklist Table for

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37 Executive Order S-3-05, Assembly Bill 32, and the Bay Area 2017 Clean Air Plan (continuing the trajectory set in the 2010 Clean Air Plan) set a target of reducing GHG emissions to below 1990 levels by year 2020.

38 Office of the Governor, Executive Order S-3-05, June 1, 2005, *http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf*, accessed March 26, 2021. Executive Order S-3-05 sets forth a series of target dates by which statewide emissions of GHGs need to be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 million metric tons of carbon dioxide equivalents [$MTCO_2E$]); by 2020, reduce emissions to 1990 levels (approximately 427 million $MTCO_2E$); and by 2050 reduce emissions to 80 percent below 1990 levels (approximately 85 million $MTCO_2E$). Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

39 Office of the Governor, Executive Order B-30-15, April 29, 2015, *https://www.ca.gov/archive/gov39/2015/04/29/news18938/index.html*, accessed May 26, 2021. Executive Order B-30-15, issued on April 29, 2015, sets forth a target of reducing GHG emissions to 40 percent below 1990 levels by 2030 (estimated at 2.9 million $MTCO_2E$).

40 San Francisco's GHG reduction goals are codified in section 902 of the environment code and include: (i) by 2008, determine City GHG emissions for year 1990; (ii) by 2017, reduce GHG emissions by 25 percent below 1990 levels; (iii) by 2025, reduce GHG emissions by 40 percent below 1990 levels; and (iv) by 2050, reduce GHG emissions by 80 percent below 1990 levels.

41 Senate Bill 32 amends California Health and Safety Code Division 25.5 (also known as the California Global Warming Solutions Act of 2006) by adding section 38566, which directs that statewide greenhouse gas emissions to be reduced by 40 percent below 1990 levels by 2030.

42 Senate Bill 32 was paired with Assembly Bill 197, which would modify the structure of the State Air Resources Board; institute requirements for the disclosure of greenhouse gas emissions criteria pollutants, and toxic air contaminants; and establish requirements for the review and adoption of rules, regulations, and measures for the reduction of greenhouse gas emissions.

Greenhouse Gas Analysis (Table 2: Municipal Projects.)[43] The SFMTA and the private project co-sponsor (or lead developer) would be required to incorporate all regulations applicable to the proposed project or project variants.

Impact C-GG-1: The proposed project or project variants would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions. (*Less than Significant*)

Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operational phases. Direct operational emissions include GHG emissions from new vehicle trips and area sources. Indirect emissions include emissions from electricity providers; energy required to pump, treat, and convey water; and emissions associated with waste removal, disposal, and landfill operations.

The proposed project or project variants would increase the intensity of use at the site by replacing the existing transit facility (the maintenance and operations building and associated bus storage yard) with a new and expanded transit facility and integrated residential and commercial uses as part of a larger joint development. Therefore, operation of the proposed project or project variants would contribute to annual long-term increases in GHGs as a result of increased vehicle trips (mobile sources), energy use, water use, wastewater treatment, and solid waste disposal. Construction activities would also result in temporary increases in GHG emissions.

The proposed project or project variants would be subject to regulations adopted to reduce GHG emissions as identified in the City's GHG reduction strategy. As discussed below, compliance with the applicable regulations would reduce the proposed project's or project variants' GHG emissions related to construction activities, transportation, energy use, water use, waste disposal, and wood burning.

Compliance with the City's Commuter Benefits Ordinance, Healthy Air and Clean Transportation Ordinance, transportation management programs, bicycle parking requirements, the transportation sustainability fee, and car-sharing requirements would reduce the proposed project's or project variants' transportation-related emissions. These regulations reduce GHG emissions from single-occupancy vehicles by promoting the use of alternative transportation modes with zero or lower GHG emissions on a per capita basis. In addition to no parking for the residential uses, the proposed project or project variants would provide up to 12 car-share spaces. Furthermore, both the SFMTA and the private project co-sponsor would incorporate multiple transportation demand management (TDM) measures into their operations to reduce vehicle trips and encourage sustainable modes of transportation. TDM measures that would be incorporated into the design of the proposed project or project variants include affordable housing units (which exhibit fewer auto trips than market-rate housing), bicycle parking spaces, commuter shower and locker facilities for employees, and sidewalks and streetscapes that prioritize safety for pedestrians and bicyclists. Additional TDM measures could include delivery supportive amenities (such as

[43] San Francisco Planning Department, Compliance Checklist Greenhouse Gas Analysis and Greenhouse Gas Analysis for Municipal Development, Compliance Checklist Table for Greenhouse Gas Analysis: Table 2. Municipal Projects, Potrero Yard Modernization Project, 2500 Mariposa Street, May 24, 2021.

temporary storage for package delivery, which may reduce auto trips),[44] bicycle sharing stations, and other approaches to discourage the use of single-occupant private vehicles. These design features of the proposed project or project variants would contribute to reducing project-related GHG emissions and would further efforts to meet the City's targeted GHG reduction goals for 2025 and 2050.

The proposed project or project variants would be required to comply with the energy efficiency requirements of the City's Green Building Code, Stormwater Management Ordinance, and Commercial Water Conservation Ordinance, which would promote energy and water use efficiency, thereby reducing the proposed project's or project variants' energy-related GHG emissions.[45]

Additionally, the proposed project or project variants would be required to meet the renewable energy criteria of Title 24 of the California Code of Regulations and the San Francisco Green Building Code (green building code), including renewable energy generation or green roof installation. The proposed project or project variants would also address the SFMTA's Sustainability and Climate Action Program, which aims to reduce the transportation sector's contribution to GHG emissions, reduce transportation-related resource consumption and waste, and develop and improve San Francisco's multi-modal transportation system and broader transportation network.[46] To support these goals, Muni buses will transition to 100 percent electric by 2035.[47] Currently, Muni buses run on two renewable fuels, electricity from the Hetch Hetchy Dam and renewable diesel. Additionally, upgrades and modernization of the SFMTA's portfolio of buildings, including Potrero Yard, are part of a citywide effort to reduce water and energy consumption.[48] The proposed project or project variants would be consistent with the objectives in the SFMTA Sustainability and Climate Action Program, further reducing the proposed project's or project variants' energy-related GHG emissions.

As discussed in EIR Chapter 2, Project Description (p. 2.48), the proposed project or project variants would obtain Leadership in Energy and Environmental Design (LEED) Gold certification. LEED is a green building certification program that recognizes best-in-class building strategies and practices. To receive LEED certification, building projects must satisfy prerequisites and earn points to achieve different levels of certification. Examples of design requirements for LEED Gold certification are meeting insulation, roofing, and plumbing performance goals; restricting the use of toxic substances such as volatile organic compounds (VOCs) that are components in certain sealants and construction materials; and restricting the use of hydrochlorofluorocarbon refrigerants in heating,

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44 San Francisco Planning Department, Standards for the Transportation Demand Management Program: Appendix A TDM Measures, updated June 7, 2018, p. 35, *https://sfplanning.org/transportation-demand-management-program*, accessed May 28, 2021.

45 Compliance with water conservation measures reduce the energy (and GHG emissions) required to convey, pump, and treat water required for the project.

46 San Francisco Municipal Transportation Agency (SFMTA), Sustainability and Climate Action, *https://www.sfmta.com/sustainability-and-climate-action*, accessed March 26, 2021.

47 SFMTA, San Francisco Transportation Sector Climate Action Strategy, *https://www.sfmta.com/sites/default/files/reports-and-documents/2017/12/cap_draft_full_document-final1.pdf#page=28*, accessed March 26, 2021.

48 San Francisco Department of the Environment, San Francisco Climate Action Strategy – 2013 Update, October 2013, *https://sfenvironment.org/sites/default/files/fliers/files/sfe_cc_climateactionstrategyupdate2013.pdf*, pp. 12-22, accessed March 26, 2021.

ventilation, and air conditioning (HVAC) systems.[49] Other LEED Gold certification design strategies for the proposed project or project variants would include using water-efficient fixtures for indoor potable water-use reduction, meeting energy efficiency standards, and providing onsite renewable energy production or renewable energy credits.[50]

The proposed project or project variants would also incorporate non-potable rainwater and graywater storage and re-use systems; would develop the rooftop of the proposed new building with a mix of green roofs and/or solar photovoltaic systems; and would incorporate 12 car-share vehicle parking spaces (the project would not provide onsite residential or commercial parking spaces). The public transit component of the proposed project or project variants would include bus wash bays with dedicated water reclamation equipment to reduce potable water demand. The public transit component of the proposed project or project variants would serve an all-electric bus fleet (a mixture of trolley and battery-electric buses) when operations at Potrero Yard restart in 2026. Any existing non-revenue service vehicles that are gasoline- or diesel-powered would transition to all electric before or soon after project completion in 2026. Additionally, Muni's full revenue and non-revenue vehicle fleet would transition to all-electric by the year 2035, contributing to citywide GHG reductions.

For the private commercial and residential components of the proposed project or project variants, high-efficiency fixtures and appliances would be installed in the residential and commercial portions of the project to reduce potable water demand. These components of the proposed project or project variants would meet applicable City codes and regulations such as the water efficient irrigation, residential water conservation, and residential energy conservation ordinance, including Title 24 of the California Code of Regulations. Convenient recycling, composting, and trash areas would be provided for both the public transit and private commercial and residential development components of the proposed project or project variants. These design features would also contribute to reducing project-related GHG emissions and would further efforts to meet the City's targeted GHG reduction goals for 2025 and 2050.

The proposed project's or project variants' waste-related emissions would be reduced through compliance with the City's Recycling and Composting Ordinance, Construction and Demolition Debris Recovery Ordinance, Construction and Demolition Debris Recycling Requirements, Clean Construction Ordinance, and green building code requirements, including Title 24 of the California Code of Regulations. These regulations reduce the amount of materials sent to a landfill, reducing GHGs emitted by landfill operations. These regulations also promote reuse of materials, conserving their embodied energy[51] and reducing the energy required to produce new materials. The proposed project or project variants would use as much cut soil as fill soil in other areas of the site, minimizing or eliminating the need for either soil import or export. Cut and excavated material would be recycled and re-used

[49] HATCH, HDR, Sitelab, VerPlanck, and CHS, Potrero Yard: 3-Level Bus Facility Design Criteria Document, Version 2, June 2019, (hereinafter referred to as "Design Criteria Document, Version 2"), pp. 36, 46, 84, 88, and 104.

[50] San Francisco Planning Department, Compliance Checklist Greenhouse Gas Analysis and Greenhouse Gas Analysis for Municipal Development, Compliance Checklist Table for Greenhouse Gas Analysis: Table 2. Municipal Projects, Potrero Yard Modernization Project, 2500 Mariposa Street, May 24, 2021.

[51] Embodied energy is the total energy required for the extraction, processing, manufacture, and delivery of building materials to the building site.

onsite to the extent possible, which would further reduce the amount of materials sent to a landfill and associated hauling trips.

Compliance with the City's street tree planting requirements would serve to increase carbon sequestration,[52] as the proposed project or project variants would retain or replace existing street trees along Bryant, Hampshire, and 17th streets, and add street trees along Mariposa Street where there are currently no street trees adjacent to the project site. As discussed in EIR Chapter 2, Project Description (p. 2.47), the SFMTA and private project co-sponsor would develop the site with a landscaped open area along 17th Street and common open space on top of the 75-foot-tall transit facility component of the project. Each of these spaces would be planted with drought-tolerant species.

Other regulations such as the air district's wood-burning regulations would reduce emissions of black carbon. Regulations requiring low-emitting finishes would reduce VOCs.[53] Thus, the proposed project or project variants was determined to be consistent with San Francisco's GHG reduction strategy.[54]

The SFMTA and private project co-sponsor would be required to comply with these regulations, which have proven effective, as San Francisco's GHG emissions have measurably decreased compared to 1990 emissions levels, demonstrating that the City has met and exceeded EO S-3-05, AB 32, and the 2017 Clean Air Plan GHG reduction goals for the year 2020. Furthermore, the City has met its 2017 GHG reduction goal of reducing GHG emissions to 25 percent below 1990 levels by 2017. Other existing regulations, such as those implemented through AB 32, will continue to reduce a proposed project's contribution to climate change. In addition, San Francisco's local GHG reduction targets are consistent with the long-term GHG reduction goals of EO S-3-05, EO B-30-15, AB 32, SB 32, and the 2017 Clean Air Plan. As described in EIR Section 3.E, Air Quality, pp. 3.E.59-3.E.62, the proposed project or project variants would also comply with supporting measures at the regional level such as those in the 2017 Clean Air Plan related to transportation, buildings, energy, natural and working lands, waste, and water control measures (e.g., TR2-Trip Reduction Programs, TR15-Public Outreach and Education, BL1 Green Buildings, NW2 Urban Tree Planting, WA4-Recycling and Waste Reduction, and WR2-Support Water Conservation.)

In addition to regulations identified in the Compliance Checklist Table for Greenhouse Gas Analysis (Table 2: Municipal Projects),[55] the proposed project or project variants would be subject to all applicable local and state codes including the City's planning code, Environment Code, Health Code, green building code, Public Works Code, Administrative Code, Housing Code, and Public Utilities Commission Code requirements and Title 24 of the

[52] Carbon sequestration is the long-term storage of carbon in plants, soils, geologic formations, and the ocean.

[53] While not a GHG, volatile organic compounds are precursor pollutants that form ground level ozone. Increased ground level ozone is an anticipated effect of future global warming that would result in added health effects locally. Reducing volatile organic compound emissions would reduce the anticipated local effects of global warming.

[54] San Francisco Planning Department, Compliance Checklist Greenhouse Gas Analysis and Greenhouse Gas Analysis for Municipal Development, Compliance Checklist Table for Greenhouse Gas Analysis: Table 2. Municipal Projects, Potrero Yard Modernization Project, 2500 Mariposa Street, May 24, 2021.

[55] San Francisco Planning Department, Compliance Checklist Greenhouse Gas Analysis and Greenhouse Gas Analysis for Municipal Development, Compliance Checklist Table for Greenhouse Gas Analysis: Table 2. Municipal Projects, Potrero Yard Modernization Project, 2500 Mariposa Street, May 24, 2021.

California Code of Regulations and the California Health and Safety Code. The SFMTA will ensure that the Project Agreement between the City and the private project co-sponsor incorporates all applicable regulations, further reducing the amount of GHGs associated with the proposed project or project variants. Therefore, because the proposed project or project variants would be consistent with the City's GHG reduction strategy, it would also be consistent with the GHG reduction goals of EO S3-05, EO B-30-15, AB 32, SB 32, and the 2017 Clean Air Plan, would not conflict with these plans, and would therefore not exceed San Francisco's applicable GHG threshold of significance. As such, the proposed project or project variants would result in less-than-significant impacts with respect to GHG emissions, and mitigation measures are not required. This topic will not be discussed in the EIR.

E.10 Wind

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
10. WIND. Would the project:					
a) Create wind hazards in publicly accessible areas of substantial pedestrian use?	☒	☐	☐	☐	☐

EIR Section 3.F, Wind, provides a detailed analysis of the pedestrian-level wind effects of the proposed building design on publicly accessible sidewalks and other areas of substantial pedestrian use, addressing initial study checklist topic E.10(a). The EIR includes a complete description of the existing environmental setting and regulatory framework, approach to the analysis, an impact evaluation of the proposed project and its variants and cumulative impacts, and, if appropriate, identification of mitigation measures. The significance of the proposed project or project variants' effects on pedestrian-level wind speeds is based on the results of wind tunnel testing (see EIR Appendix H).

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E.11 Shadow

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
11. SHADOW. Would the project:					
a) Create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces?	☒	☐	☐	☐	☐

EIR Section 3.G, Shadow, provides a detailed analysis of the shadow cast by the proposed building design on Franklin Square – the only publicly accessible park and open space that could be substantially and adversely affected by the proposed project. The EIR addresses initial study checklist topic E.11(a) and includes a complete description of the existing environmental setting and regulatory framework, the approach to the analysis, an impact evaluation of the proposed project and its variants and cumulative impacts, and, if appropriate, identification of mitigation measures. The significance of the proposed project or project variants' effects on the use and enjoyment of Franklin Square is based on detailed shadow modeling and park user surveys (see EIR Appendix I).

E.12 Recreation

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
12. RECREATION. Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☒	☐	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐	☐

Summary of Recreation Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to recreation (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Existing Recreation Resources

The San Francisco Recreation and Parks Department administers more than 220 public parks, playgrounds, and open spaces throughout the City, as well as recreational facilities such as recreation centers, swimming pools, golf courses, and athletic fields, tennis courts, and basketball courts. Table 2: Recreation and Parks Department

Resources within 0.5 Mile of the Project Site lists recreational resources within 0.5 mile of the project site. Additionally, there is one off-street multi-use path within 0.5 mile of the project site that is identified in the Recreational and Open Space Element (ROSE) of the general plan. The path begins approximately 700 feet northwest of the project site at the intersection of 16th and Harrison streets and extends to the northeast along Treat Street. There are no state- or federally owned open spaces, privately owned public open spaces, or other existing open spaces within 0.5 mile of the project site. Regional open space attractions, including City, state, and federal properties, are located throughout the City and greater Bay Area and include Golden Gate Park, the Presidio, San Bruno Mountain, and Muir Woods.

Table 2: San Francisco Recreation and Parks Department Resources within 0.5 Mile of the Project Site

Name	Size (acres)	Distance from Project Site (feet)	2019 Maintenance Score NOTE A	Amenities NOTES A, B, C
Franklin Square	5.18 NOTE D	30	87.07	Soccer field, picnic area, playground
In Chan Kaajal Park	0.85	1,435	92.82	Outdoor courts, picnic area, playground, restrooms, community garden
Jackson Playground	4.95	2,285	88.71	Baseball field, softball field, basketball court, tennis court, bocce ball, community room, playground, picnic area, restrooms
Jose Coronado Playground	1.00	2,305	94.23	Basketball court, tennis court, multi-sport court, community room, playground
McKinley Square	2.90	1,410	89.06	Dog play area, picnic area, playground, community garden
Mission Recreation Center	0.70	1,840	96.07	Youth soccer field, basketball court, boxing, gymnastics, handball, gym, weight room, ping pong, restrooms
Utah & 18th Mini Park	0.15	650	96.58	Petanque court

Notes:

NOTE A San Francisco Office of the Controller, San Francisco Park Maintenance Scores (Park Lookup Tab), 2020. *https://sfgov.maps.arcgis.com/apps/MapSeries/index.html?appid=04937b03318a44ae81d90c240de4e3d1*, accessed May 5, 2021.

NOTE B San Francisco Recreation and Parks, Parks and Facilities, 2020, *https://sfrecpark.org/Facilities*, accessed May 5, 2021.

NOTE C San Francisco Recreation and Parks, Park Evaluations – Park Features List, 2020, *https://sfrecpark.org/DocumentCenter/Index/1462*, accessed May 5, 2021.

NOTE D Franklin Square functionally covers 5.18 acres, with 4.41 acres under San Francisco Recreation and Parks jurisdiction and 0.77 acre under public works jurisdiction.

Source: DataSF, Recreation and Parks Properties, April 30, 2020, *https://data.sfgov.org/Culture-and-Recreation/Recreation-and-Parks-Properties/wkn6-jn8k*, accessed May 5, 2021.

In 2003, voters approved an amendment to the City Charter mandating the evaluation of park maintenance at City parks. The maintenance score for each park is based on criteria that reflect the different facilities at each park. These scores reflect the park's performance in categories such as play areas, greenspace, hardscape, lawns, restrooms, and seating areas. In 2019, scores ranged from 77 to 99 percent, with an average score of 92 percent. Table 2 shows the maintenance score for parks within 0.5 mile of the project site. The average score of all parks within 0.5 mile is 92.08 percent, which signifies that the parks are clean, well maintained, and in good condition.

Project-Specific Impacts

Impact RE-1: The proposed project or project variants would increase the use of existing neighborhood parks and other recreational facilities, but not to such an extent that substantial physical deterioration of the facilities would occur or be accelerated or that the construction of new or expanded facilities would be required. (*Less than Significant*)

As described in Section E.3, Population and Housing, implementation of the proposed project or project variants would add approximately 548 new employees and 1,357 new residents to the project site (see Table 1, p. 22). This would represent an approximately 137 percent increase over the existing 400 employees on the project site. The residential component would be new to the project site, and the new residents would represent an approximately 0.15 percent increase in residents citywide since 2019. It would comprise approximately 0.4 percent of the population growth expected in the City between 2010 and 2040; and 4.5 percent of the projected population growth in the Eastern Neighborhoods PDA over the same period. This residential and employment population growth would increase the demand for parks, open space, and recreation facilities in the project area and citywide over existing conditions.

The proposed project or project variants would provide approximately 91,000 square feet of common open space on the top of the proposed replacement transit facility. The common open space would include a large courtyard on the northern portion of the podium, and two interior courtyards on the southern portion of the podium. The overall amount of planning code-required open space for the proposed project or project variants would be finalized through the design and planning entitlement process. New residents would be able to use the common open space provided by the proposed project or project variants, as well as parks and recreational facilities in the vicinity of the project site and in the region. Some open space on the top of the replacement transit facility would be accessible to SFMTA and other building employees. In addition to the proposed common open space, future onsite residents and employees would also be able to use the seven recreational facilities identified above within 0.5 mile of the project site as well as regional open space attractions offered in the City, such as Golden Gate Park, the Presidio, Lake Merced, and McLaren Park, among others.

Increases in population resulting from the new residents, net new onsite employees, and the relocation of the SFMTA employees would not represent substantial growth. The resulting increase in recreation demand would not be in excess of that expected, provided for, or planned for in the project area and the City as a whole. Therefore, it is unlikely that the proposed project or project variants would substantially increase the demand for or use of nearby neighborhood parks and recreational facilities or citywide facilities to the extent that physical deterioration would occur or be accelerated or require the construction or expansion of recreational facilities that could result in significant physical environmental impacts. As such, the proposed project or project variants would have a less-than-significant impact on parks and recreational facilities, and mitigation measures are not required. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-RE-1: The proposed project or project variants, in combination with other cumulative projects, would not result in significant cumulative impacts on recreational facilities or resources. (*Less than Significant*)

As discussed in Section E.3, Population and Housing, San Francisco had a population of approximately 881,549 in 2019. According to ABAG's Projections 2040, San Francisco's population will increase to 1,169,485 in 2040 (approximately 360,340 more than the 2010 population of 809,145).[56] The 1,357 new residents generated by the proposed project would represent an approximately 0.15 percent increase over the 2019 population and would also account for approximately 0.4 percent of the residential growth expected in the City between 2010 and 2040.

Although the proposed project or project variants would represent a small portion of the projected growth for the City, overall citywide growth would generate demand for recreational resources as the population increases. The City has accounted for such growth as part of the ROSE of the San Francisco General Plan. In addition, San Francisco voters passed two bond measures, in 2008 and 2012, to fund the acquisition, planning, and renovation of the City's network of recreational resources to meet increased demand.

The geographic context for analysis of cumulative impacts to recreational resources consists of the Mission neighborhood and the recreational facilities within it. Cumulative projects identified within 0.25 mile of the project site are expected to increase the residential population of the area. The proposed project or project variants, in combination with the cumulative projects, would increase the use of parks and recreational facilities. As shown in Table 2, p. 50, there are seven well-maintained park and recreational facilities within 0.5 mile of the project site, as well as regional open space attractions offered in the City, and planned expansion of recreational facilities in the project area. The increase in demand for recreational facilities would be distributed among the existing parks, which would minimize impacts on any single park.

Further, the City has bond funding and a capital improvement plan in place to fund necessary repairs and upgrades at existing parks or to fund building new public open spaces. For example, Green Connections envisions a network of safe, functional, and attractive streets connecting people to parks, open spaces, and waterfronts. Routes on the Green Connections network are anticipated to calm traffic and prioritize pedestrian and bicycle travel. There are three proposed Green Connections routes within 0.5 mile of the proposed project: Mission to Peaks (adjacent to the project site on 17th Street), Folsom Street: Mission Creek to McLaren (approximately 1,400 feet to the west), and Noe Valley to Central Waterfront (approximately 2,350 feet to the south). Additionally, the ROSE identifies four areas within 0.5 mile of the proposed project in which the City aims to acquire and develop properties as open space sites. These four areas are to the northeast (generally between 15th and 7th streets), east (generally between Irwin and 16th streets), south (generally between 24th and 20th streets), and west (generally between Guerrero and Folsom streets) of the project site. The ROSE also identifies school yards and San Francisco Public Utilities Commission (SFPUC) sites for potential open space development, including five sites within 0.5 mile of the

[56] MTC and ABAG, Projections 2040 by Jurisdiction (Curated), updated May 2019, *http://projections.planbayarea.org/,* accessed March 26, 2021.

proposed project, to the east, south, and west. As with the proposed project or project variants, cumulative projects would also be required to comply with the applicable open space requirements of the planning code, thereby partially offsetting their demand on parks or open spaces. Therefore, the proposed project or project variants would not combine with cumulative projects in the project vicinity to create significant cumulative recreation impacts. Mitigation measures are not required. This topic will not be discussed in the EIR.

E.13 Utilities and Service Systems

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
13. UTILITIES AND SERVICE SYSTEMS. Would the project:					
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant physical environmental effects?	☐	☐	☒	☐	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐	☐

Summary of Utilities and Service Systems Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to utilities and service systems (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

The project site is within an urban area that is served by water storage, treatment, and distribution facilities; combined wastewater and stormwater collection, storage, treatment, and disposal facilities; solid waste collection and disposal service systems; and electric power and telecommunications facilities. The site is not served by a

natural gas provider. Because the project variants would have the same construction and land use development programs as the proposed project, the conclusions for the proposed project related to Utilities and Service Systems would also be applicable to the project variants.

Water, Wastewater, Stormwater, Power, Telecommunications

Impact UT-1: The proposed project or project variants would not require or result in the relocation or construction of new or expanded water, wastewater, stormwater drainage, electric power, natural gas, or telecommunications facilities. (*Less than Significant*)

The SFPUC provides and operates water storage, treatment, and distribution facilities and combined wastewater/stormwater collection, storage, treatment, and disposal facilities for the City. Pacific Gas & Electric provides the electrical distribution network (in-street distribution circuits and substations at different locations in the City). The SFPUC provides electric power to customers through the Pacific Gas & Electric distribution infrastructure. The site is not served by a natural gas provider, although there is natural gas infrastructure in the immediate vicinity. Various private companies provide telecommunications services.

Water Distribution

The project site is supplied with water from the Hetch Hetchy Regional Water System and is currently served by a water distribution network operated by the SFPUC's City Distribution Division. Domestic water is provided by 8-inch-diameter water lines under 17th and Bryant streets and 12-inch-diameter water lines under Hampshire and Mariposa streets. Fire-fighting water supply lines are located under 17th Street (a 36-inch line), at the corner of Hampshire/Mariposa streets (a 6-inch line), and Bryant Street (an 8-inch line). An additional fire-fighting water supply line (part of the City's Emergency Firefighting Water System) is located under Bryant Street (a 12-inch line), with hydrants located on the southeast corner of Mariposa Street and the northeast corner of 17th Street.

Given the size of the water supply lines and the configuration of the existing water distribution network in the immediate project area, the system would likely have hydraulic capacity to serve the proposed project or project variants. The SFPUC's City Distribution Division would conduct a hydraulic analysis to confirm that the existing system could meet the proposed project's or project variants' water demands, including those for fire suppression system pressure and flow. If the analysis finds the existing infrastructure is inadequate to meet the projected demands, the SFPUC would modify the water conveyance system and upsize the water lines and appurtenances if necessary. Such modifications could require a limited amount of excavation, trenching, and soil movement, which would occur within public rights-of-way. These activities, if determined to be required, would be subject to public works' SCMs and would be similar to those associated with construction of the proposed project or project variants, but more limited. Ground-disturbing activities in immediately adjacent public rights-of-way would not result in significant environmental effects not already disclosed in this initial study and EIR for construction of the proposed project or project variants. Therefore, impacts related to requiring the construction of new or the expansion of existing water storage, treatment, and distribution facilities would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Wastewater/Stormwater Collection

The project site is served by San Francisco's combined sewer system, which collects, transports, and treats most of the wastewater and stormwater at one of the three SFPUC treatment facilities.[57] The combined collection and treatment system is sized to accommodate both daily wastewater flows and stormwater runoff. The current collection system design standard is to provide enough drainage capacity to contain a five-year storm (a storm with a 20 percent chance of occurring in one year).[58] Wastewater and stormwater generated by the proposed project would be treated at the Southeast Water Pollution Control Plant, which currently treats 60 million gallons per day (mgd) of wastewater and has the capacity to treat up to 250 mgd during a rainstorm.[59]

The surrounding wastewater/stormwater collection infrastructure consists of an 8-inch-diameter sewer line under 17th Street that transitions to 12 inches about 200 feet west of Hampshire Street and to 14 inches west of Bryant Street. It connects with an 8-inch-diameter sewer line under Bryant Street. Under Hampshire Street, a separate 8-inch sewer line starts south of the intersection and connects with the 18-inch-diameter sewer line under Mariposa Street, which connects with the 8-inch-diameter sewer line under Bryant Street. The proposed building would connect to the existing sewer lines along 17th, Hampshire, Mariposa, and Bryant streets via sewer laterals.

Under existing conditions, there are approximately 400 employees associated with the transit facility, including approximately 295 trolley bus operators. As described above in Impact PH-1 in Section E.3, Population and Housing, the proposed project or project variants would add approximately 548 net new employees and 1,357 new permanent residents. The proposed project would also increase the number of trolley buses maintained onsite to up to 213, with three new bus wash areas.

To analyze the proposed project or project variants' projected potable and non-potable water needs, the SFPUC prepared a water supply assessment (see Appendix A [attached to this initial study]).[60] The water supply assessment assumed that the expansion of the transit use would generate an increase in water demand to maintain at least 55 new trolley buses in the new bus wash areas as well as accommodate the introduction of up to 1,905 net new persons (1,357 residents and 548 employees) to the project site.

The proposed project or project variants would incrementally increase wastewater flows from the project site due to the expanded transit fleet and the introduction of new residents and employees to the site. The proposed project or project variants would incorporate water-conserving design features, such as low-flush toilets and urinals, required by Title 24 of the California Code of Regulations and the green building code, and would integrate a system

[57] San Francisco Public Utilities Commission (SFPUC), Sewer System Improvements Fact Sheet, *http://sfwater.org/modules/showdocument.aspx?documentid=10762*, accessed March 26, 2021.

[58] SFPUC, San Francisco Sewer System Master Plan, Summary Report, Final Draft, March 2010, p. 3-4, *http://www.gestaltgraphics.com/docs/SFSSSummary.pdf*, accessed March 26, 2021.

[59] SFPUC, SFPUC Sewer System Improvement Program, July 2019, *https://sfwater.org/modules/showdocument.aspx?documentid=14116*, accessed March 26, 2021.

[60] SFPUC, Water Supply Assessment for the Potrero Yard Modernization Project (2500 Mariposa Street), October 27, 2020.

to capture and treat graywater[61] from lavatories and showers for use as flush water and/or irrigation water. The proposed project or project variants would also recycle wash water in the bus yard and divert stormwater from the roof (the stormwater management system is described below). These elements would minimize the use of potable water and maximize the re-use of water onsite.[62]

The residential component of the proposed project or project variants would be designed to incorporate water-conserving measures, as required by California Building Standards Code (state building code) section 402.0(c); residential submetering, as required by California Water Code sections 537-537.5 as added in 2016 by Senate Bill 7; and a rainwater and graywater system, as required by San Francisco's Non-potable Water Ordinance. Compliance with these regulations would reduce the amount of potable water used for building functions and therefore reduce wastewater flows. The water supply assessment determined that compliance with the Non-potable Water Ordinance would offset approximately 37 percent of projected total water demand.[63]

As discussed above, the combined sewer system is sized to accommodate both daily wastewater flows and stormwater runoff from a five-year storm; therefore, wastewater is a small component of the design flow. Most of the flow during wet weather events comes from stormwater runoff.

With regards to stormwater collection, the existing project site is completely covered with impervious surfaces. The proposed project or project variants would not expand any existing impervious surfaces and therefore would not result in an increase in stormwater runoff.

The proposed project or project variants would be required to comply with the City's Stormwater Management Ordinance (as codified in San Francisco Public Works Code [public works code] section 147) and the 2016 Stormwater Management Requirements and Design Guidelines, which requires projects replacing more than 5,000 square feet of impervious surface to decrease the existing stormwater runoff flow rate and volume at the site by 25 percent for a two-year 24-hour design storm.[64]

The proposed project or project variants would be required to implement a stormwater control plan as approved by the SFPUC. The plan would include a maintenance agreement signed by the project sponsor for proper functioning of the stormwater controls. The proposed project or project variants would incorporate several stormwater-control features to meet these requirements:

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[61] Graywater is "untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom sinks, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers." Source: San Francisco Health Code, Article 12C, Alternate Water Sources for Non-Potable Applications, *https://sfwater.org/Modules/ShowDocument.aspx?documentID=10422*, accessed May 28, 2021.

[62] Design Criteria Document, Version 2, p. 37 and p. 71.

[63] SFPUC, Water Supply Assessment for the Potrero Yard Modernization Project (2500 Mariposa Street), October 27, 2020, p. 13.

[64] SFPUC, Stormwater Management Requirements and Design Guidelines, May 2016, *https://sfwater.org/Modules/ShowDocument.aspx?documentID=9026*, accessed March 26, 2021.

- An onsite stormwater holding tank would be installed to capture stormwater for use as a non-potable water supply for the bus wash water recycling system and irrigation.
- Streetscape improvements would include low-impact design measures, such as vegetated sidewalk planting areas and permeable pavement.
- Onsite rainwater and graywater capture systems would be installed to provide a non-potable water supply for use as flush water for bathroom facilities within the expanded transit facility and the proposed residential and commercial uses.[65]

These features would manage stormwater onsite and limit demand on the City's stormwater collection system and facilities.

Given that the proposed project or project variants would be designed to reduce the peak stormwater runoff flow rate and volume for a two-year, 24-hour design storm event by at least 25 percent over existing conditions, the existing downstream conveyance system for wastewater and stormwater would have sufficient capacity to accommodate the combined wastewater/stormwater flows generated by the proposed project.

The project sponsor team would be required to work with the SFPUC and the San Francisco Public Works' Engineering Hydraulics Division to determine if existing and adjacent wastewater and stormwater infrastructure could accommodate the flows. If the existing infrastructure is found to be inadequate to meet the proposed project's or project variants' demand, the SFPUC would modify the wastewater/stormwater conveyance system and upsize the existing sewer lines and appurtenances if necessary.[66] The construction of the larger conveyance facilities could require a limited amount of excavation, trenching, and soil movement, which would occur mostly within public rights-of-way. These activities would be subject to public works' SCMs and would be similar to those associated with construction of the proposed project or project variant, but more limited. Ground-disturbing activities in immediately adjacent public rights-of-way would not result in significant environmental effects not already disclosed in this initial study and EIR. Therefore, impacts related to requiring the construction of new or the expansion of existing combined wastewater and stormwater collection, storage, treatment, and disposal facilities would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Electricity and Telecommunications

The site is not served by a natural gas provider. The site is served by SFPUC electric power using the Pacific Gas & Electric distribution infrastructure (i.e., via the Potrero PP (A) 1119 Circuit – a 12-kilovolt circuit under the east portion of 17th Street and north portion of Hampshire Street).[67] Existing electrical usage at Potrero Yard indicates an average monthly demand of 18,853 kilowatt-hours (approximately 226 megawatt-hours of electricity per year).[68] Although

[65] Design Criteria Document, Version 2, pp. 37-38.

[66] City and County of San Francisco, E-mail communication between Rachel Alonso, Project Manager, Public Works, and Bimayendra Shrestha, P.E., Public Works, November 23, 2020.

[67] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 1 and pp. 30-36.

[68] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 34.

Potrero Yard does not use Pacific Gas & Electric power, the 226 megawatt-hours of electricity usage would represent less than 1.0 percent of the electricity consumed from PG&E in San Francisco in 2019 and distributed through their electrical network.[69]

The Potrero PP (A) 1119 circuit has an existing capacity of 8.2 megawatts. Pacific Gas & Electric estimates that the projected peak load of this circuit is 5.7 megawatts, leaving approximately 2.5 megawatts of available capacity.[70] This voltage is fed from the Potrero Substation along Illinois Street between 23rd and 24th streets, approximately 1.7 miles from the project site. The Potrero Substation has a distribution capacity of 74 megawatts. Additionally, there are two 12-kilovolt circuits and one 4.2-kilovolt circuit in the vicinity of the project site, as follows:

- the Potrero PP (A) 1101 Circuit – a 12-kilovolt circuit under Mariposa Street and the southern portion of Hampshire Street with an existing capacity of 9.5 megawatts and a projected peak load capacity of 7.8 megawatts, leaving approximately 1.7 megawatts of available capacity;
- the Mission (X) 1125 Circuit – a 12-kilovolt circuit under Bryant Street with an existing capacity of 12.2 megawatts and a projected peak load capacity of 7.5 megawatts, leaving approximately 4.7 megawatts of available capacity; and
- the SF E 0409 Circuit – a 4.2-kilovolt circuit under 17th Street with an existing capacity of 2.4 megawatts and a projected peak load capacity of 0.9 megawatts, leaving approximately 1.5 megawatts of available capacity.

The maximum capacity at a single nearby circuit is 4.7 megawatts. The average existing capacity of the nearby circuits is 2.61 megawatts, and the surround grid capacity is 10.4 megawatts.[71]

The proposed building (including the expanded transit facility) would be designed to meet LEED Gold Certification and would include an electrical distribution system for charging the future electric bus fleet and electric non-revenue vehicles.[72] Basic electrical systems requirements for the replacement transit facility would include battery-electric bus charging modules, conduit, and plug-in features; powering the mechanical systems and maintenance equipment; convenience receptacle power; interior and exterior lighting systems with controls; and an addressable fire alarm system to provide power to other utilization pieces of equipment throughout the facility.[73] Automatic load management and intelligent switchgear incorporated into the building design would function as backup to limit peak demand. Additionally, for service to the redeveloped site, electrical transformers and four electrical utility service interrupters would be required. The electrical utility service interrupters would be located on the building's

[69] In 2019, San Francisco customers purchased 5.6 million megawatt hours (MWh) of electricity from Pacific Gas & Electric. California Energy Commission, Electricity Consumption by County, *http://www.ecdms.energy.ca.gov/elecbycounty.aspx*, accessed May 28, 2021.

[70] Peak loads for the Potrero 1119 Circuit are monitored by Pacific Gas & Electric and published on their Integration Capacity Analysis map. The load increases in winter months and has peaks at 9 a.m. and 8 p.m. Usage is at its minimum between 2 a.m. and 6 a.m.

[71] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 60.

[72] The SFMTA Board of Directors has committed to an electric bus fleet by 2035.

[73] Design Criteria Document, Version 2, p. 48.

exterior along 17th Street.[74] If the electrical transformer vault is not located in the basement level it would be located in subsurface sidewalk areas with proper encroachment permits from public works.

The expanded transit facility and introduction of new residential and commercial uses would increase demand for electric power on the project site, with a projected peak demand of up to 12.8 megawatts to accommodate the transit facility (building) peak demand and the peak demand associated with existing buses and the new battery-electric bus fleet and non-revenue vehicles.[75] The projected peak demand for the residential and commercial components of the project would be 3 megawatts and 5 megawatts, respectively, for an overall peak demand of 20.8 megawatts for the proposed project or project variants.[76]

Energy efficiency requirements and features such as those described above generally seek to reduce energy use on a permanent and consistent basis through the installation of energy efficient technologies. However, it is also important to manage peak energy usage. This is achieved through load management, which focuses on either curtailing or shifting electrical demands away from peak demand periods when the power grid is under the most strain. Load management is important in maintaining a reliable electricity source and in avoiding the need to construct additional electricity, generation, or distribution facilities to meet peak demands that typically occur on the order of hours per year. As noted above, with load management the peak daily electricity demand of the proposed project or project variants would reach approximately 20.8 megawatts. Although Potrero Yard does not use Pacific Gas & Electric power, the proposed project's or project variants' contribution to peak energy demands would represent less than 0.09 percent of the peak load in Pacific Gas & Electric planning area.[77] The peak load would be able to be accommodated by existing electric power infrastructure at the Pacific Gas & Electric planning area level; however, localized improvement (i.e., on the project site and in the immediately adjacent public rights-of-way) would be required for interconnections.

The SFMTA is currently in the planning process for systemwide facility conversion to support battery-electric bus charging infrastructure as part of the SFMTA's zero emission facility and fleet transition plan. The design of the proposed building will incorporate battery-electric bus infrastructure. Power needs are anticipated to increase to accommodate the shift to a battery electric fleet; therefore, the SFMTA and the SFPUC, the site's power provider, are engaged in distribution capacity review to secure adequate services.[78] It is not anticipated that the increase in electric power demand for the expanded transit facility and its battery electric fleet and the joint development

[74] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 36.

[75] SFMTA, Potrero Yard Modernization Project, 2500 Mariposa Street, SF Public Utilities Commission (PUC) Wholesale Distribution Tariff (WDT) Application for Power Service, April 15, 2021.

[76] SFMTA, Potrero Yard Modernization Project, 2500 Mariposa Street, SF Public Utilities Commission (PUC) Wholesale Distribution Tariff (WDT) Application for Power Service, April 15, 2021.

[77] The projected peak electricity demand in the Pacific Gas & Electric planning area for the 2030 high demand case is 22,694 megawatts. (California Energy Commission, California Energy Demand, 2020-2030 Baseline Forecast - High Demand Case, Peak Demand, *https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2019-integrated-energy-policy-report/2019-iepr*, accessed May 28, 2021.

[78] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 2: Facilities Power Needs and Technology Assessment Report.

components (residential and commercial uses) would require the relocation or construction of new or expanded electrical power facilities.[79]

The SFPUC is currently implementing the Bay Corridor Transmission and Distribution project, a new 230-kilovolt and 12-kilovolt GIS Substation to be completed in 2021, which is fed from Pacific Gas & Electric's Potrero Substation and available to serve the project site. This new substation will feed an estimated total of 60 megawatts of existing and future loads through 12-kilovolt feeders.[80]

The proposed project or project variants' expanded transit use (including its shift to battery electric bus fleet) and new residential and commercial components together would result in an increase in the demand for electricity and telecommunications, but this increase would not exceed the capacity of utility service providers in the project area.[81] The proposed project or project variants would install new connections to the surrounding electrical and telecommunication networks to expand service to the proposed building. The environmental impacts associated with their construction would also be subject to public works' SCMs and are evaluated in this initial study and in the EIR.

Although implementation of the proposed project or project variants would expand the existing transit use and add new residents, employees, and visitors to the project site, the proposed project would not result in the construction or relocation of new or expanded water, wastewater, stormwater drainage, electric power, or telecommunications facilities, other than the installation of localized connections and upgrades to the existing systems. Therefore, this impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Water Supply

Impact UT-2: Sufficient water supplies are available to serve the proposed project or project variants and reasonably foreseeable future development in normal, dry, and multiple dry years, unless the Bay Delta Plan Amendment is implemented; in that event, the SFPUC may develop new or expanded water supply facilities to address shortfalls in single and multiple dry years, but this would occur with or without the proposed project or project variants. Impacts related to new or expanded water supply facilities cannot be identified at this time or implemented in the near term; instead, the SFPUC would address supply shortfalls through increased rationing, which could result in significant cumulative effects, but the proposed project or project variants would not make a considerable contribution to impacts from increased rationing. (*Less than Significant*)

In 2016, the SFPUC adopted its 2015 Urban Water Management Plan for the City and County of San Francisco (2015 Urban Water Management Plan), which estimates a projected retail supply of 89.9 mgd through the year 2040

[79] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 60.

[80] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 1.

[81] WSP USA, Inc, Zero Emission Facility and Fleet Transition Plan, Task 1: Existing Electrical Supply and Electrical Demand Baseline Assessment for the SFMTA, Final Draft, September 2020, p. 60.

from its regional water system and local water supply sources.[82] The SFPUC considers water users within San Francisco to be its retail customers, served separately from its wholesale customers in the neighboring counties of Santa Clara, Alameda, San Mateo, San Joaquin, and Tuolumne. In 2015, the SFPUC provided an average of approximately 65.6 mgd of water to its in-City retail customers.[83] The 2015 Urban Water Management Plan estimates that current and projected water supplies will meet future retail demand through 2040 under normal-year, single-dry-year, and multiple-dry-year conditions.[84] However, if a multiple-dry-year event occurs, the SFPUC will implement water use and supply reductions through its retail water shortage allocation plan to address potential shortages in the 2040 time horizon without development of additional supply.

The project site is currently served by the SFPUC's water delivery infrastructure. Development of the proposed project in accordance with the joint development concept, i.e., the expansion of the existing transit facility and the introduction of new residential and commercial uses, would not require expansion of the City's water supply system and would not adversely affect the City's water supply.

The determination that the SFPUC has sufficient water supply available to serve the proposed project and cumulative projects during normal, dry, and multiple dry years from existing entitlements and resources and would not require new or expanded water supply resources or entitlements is based on the SFPUC's project-specific water supply assessment, which considers implementation of the Bay Delta Plan Amendment.[85]

Construction

During construction, non-potable water would be required for dust control in accordance with public works code article 21 (and as otherwise permitted by law).[86] Non-potable water may not be used for demolition, pressure washing, or dust control through aerial spraying. The proposed project or project variants would use relatively small amounts of potable water for various site needs such as drinking water, onsite sanitary needs, and for cement mixing. This small increase in potable water demand would not be substantial. Thus, water use during construction would be short term and temporary and would cease with completion of construction. The SFPUC collects and transports water from various sources, e.g., the Hetch Hetchy regional water system described below, and manages the water supply such that short-term spikes in water use can be accommodated. Therefore, project construction would not require the SFPUC to develop new or expanded water supply resources or entitlements. This impact would be less than significant and will not be discussed in the EIR.

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82 SFPUC, 2015 Urban Water Management Plan for the City and County of San Francisco, June 2016 (hereinafter "2015 UWMP"), Section 7.5, Table 7-4, p. 7-10, *https://www.sfwater.org/modules/showdocument.aspx?documentid=9300*, accessed March 26, 2021.

83 SFPUC, 2015 UWMP, Section 4.1, Table 4-1, p. 4-5. This is the volume of water provided to San Francisco alone; note that there are a small number of additional retail customers outside of the City, including Groveland in the Sierra Nevada foothills.

84 SFPUC, 2015 UWMP, Section 7.5, pp. 7-9 to 7-11.

85 SFPUC, Water Supply Assessment for the Potrero Yard Modernization Project (2500 Mariposa Street), October 27, 2020.

86 San Francisco Public Works Code, Article 21: Restriction of Use of Potable Water for Soil Compaction and Dust Control Activities, *http://www.sfwater.org/modules/showdocument.aspx?documentid=1295*, accessed March 26, 2021.

As discussed under Impact UT-1 on pp. 54-57, the project site and immediate area is served by a well-developed water collection and distribution network and would continue to be supplied with water from SFPUC's Hetch Hetchy Regional Water System. As such, the proposed project or project variants would not require the construction of new water storage, treatment, and distribution facilities or the expansion of existing facilities. This impact would be less than significant and will not be discussed in the EIR.

Operation

During operation of the proposed project or project variants, the demand for potable water would increase to serve the expanded transit facility as well as the new residential and commercial uses. The following analysis evaluates: (1) whether sufficient water supplies are available to serve the proposed project and cumulative projects in normal, dry, and multiple dry years, and (2) whether the proposed project would require or result in the relocation or construction of new or expanded water supply facilities, the construction or relocation of which would have significant environmental impacts. To support this analysis, the SFPUC prepared a project-specific water supply assessment (Appendix A of the initial study). Background on the City's water system and the updated growth projections is provided below.

Hetch Hetchy Regional Water System

San Francisco's Hetch Hetchy regional water system, operated by the SFPUC, supplies water to approximately 2.7 million people. The system supplies both retail customers – primarily in San Francisco – and 27 wholesale customers in Alameda, Santa Clara, and San Mateo counties. The system supplies an average of 85 percent of its water from the Tuolumne River watershed, stored in Hetch Hetchy Reservoir in Yosemite National Park, and the remaining 15 percent from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on hydrological conditions and operational circumstances. Separate from the regional water system, the SFPUC owns and operates an in-City distribution system that serves retail customers in San Francisco.

Approximately 97 percent of the San Francisco retail water is supplied by the SFPUC regional water system. The remaining 3 percent is supplied by local water supplies, including recycled water, groundwater, and non-potable water.[87]

Water Supply Reliability and Drought Planning

In 2008, the SFPUC adopted the Phased Water System Improvement Program (WSIP) to ensure the ability of the regional water system to meet certain levels of service goals for water quality, seismic reliability, delivery reliability, and water supply through 2018.[88] The SFPUC's level of service goals for regional water supply are to meet customer water needs in non-drought and drought periods and to meet dry-year delivery needs while limiting rationing to a

[87] SFPUC, 2015 UWMP, Section 6.2, p. 6-10.

[88] On December 11, 2018, the SFPUC Commission extended the timing of the WSIP water supply decision through 2028 in its Resolution No. 18-0212.

maximum of 20 percent system-wide. In approving the WSIP, the SFPUC established a supply limitation of up to 265 mgd to be delivered from its water supply resources in the Tuolumne, Alameda, and Peninsula watersheds in years with normal (average) precipitation.[89] The SFPUC's water supply agreement with its wholesale customers provides that approximately two-thirds of this total (up to 184 mgd) is available to wholesale purchasers and the remaining one-third (up to 81 mgd) is available to retail customers. The total amount of water the SFPUC can deliver to retail and wholesale customers in any one year depends on several factors, including the amount of water that is available from natural runoff, the amount of water in reservoir storage, and the amount of that water that must be released from the system for purposes other than customer deliveries (e.g., required instream flow releases below reservoirs). A "normal year" is based on historical hydrological conditions that allow the reservoirs to be filled by rainfall and snowmelt, allowing full deliveries to customers; similarly, a "wet year" and a "dry year" are based on historical hydrological conditions with above and below "normal" rainfall and snowmelt, respectively.

For planning purposes, the SFPUC uses a hypothetical drought that is more severe than what has historically been experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought sequence used by the SFPUC for water supply reliability planning is an 8.5-year period that combines the following elements to represent a drought sequence more severe than historical conditions:

- Historical Hydrology – a six-year sequence of hydrology from the historical drought that occurred from July 1986 to June 1992
- Prospective Drought – a 2.5-year period which includes the hydrology from the 1976-1977 drought
- System Recovery Period – The last six months of the design drought are the beginning of the system recovery period. The precipitation begins in the fall, and by approximately the month of December, inflow to reservoirs exceeds customer demands and SFPUC system storage begins to recover.

While the most recent drought (2012 through 2016) included some of the driest years on record for the SFPUC's watersheds, the design drought still represents a more severe drought in duration and overall water supply deficit. Based on historical records of hydrology and reservoir inflow from 1920 to 2017, current delivery and flow obligations, and fully implemented infrastructure under the WSIP, normal or wet years occurred 85 out of 97 years. This translates into roughly nine normal or wet years out of every 10 years. Conversely, system-wide rationing is required roughly one out of every 10 years. The frequency of dry years is expected to increase as climate change intensifies, potentially requiring greater levels of rationing, which may change the amount or frequency of rationing required. The exact level of rationing that the SFPUC will impose is not ascertainable at this time because the effect that climate change has on the SFPUC water supply and delivery systems is unknown.

[89] SFPUC Resolution No. 08-200, Adoption of the Water System Improvement Program Phased WSIP Variant, October 30, 2008.

2015 Urban Water Management Plan

The California Urban Water Management Planning Act[90] requires urban water supply agencies to prepare *urban water management plans* to plan for the long-term reliability, conservation, and efficient use of California's water supplies to meet existing and future demands. The act requires water suppliers to update their plans every five years based on projected growth for at least the next 20 years.

Accordingly, the current urban water management plan for the City and County of San Francisco is the 2015 Urban Water Management Plan update.[91] The 2015 plan update presents information on the SFPUC's retail and wholesale service areas, the regional water supply system and other water supply systems operated by the SFPUC, system supplies and demands, water supply reliability, Water Conservation Act of 2009 compliance, water shortage contingency planning, and water demand management.

The water demand projections in the 2015 plan reflect anticipated population and employment growth, socioeconomic factors, and the latest conservation forecasts. For San Francisco, housing and employment growth projections are based on the San Francisco Planning Department's Land Use Allocation 2012,[92] which in turn is based on the Association of Bay Area Governments' growth projections through 2040.[93] The 2015 plan presents water demand projections in five-year increments over a 25-year planning horizon through 2040. The SFPUC will prepare the next update – the 2020 Urban Water Management Plan update – for adoption in 2021. The 2020 update will consider updated population and employment projections and anticipated water supply and demand through 2045.

The 2015 plan compares anticipated water supplies to projected demand through 2040 for normal, single-dry, and multiple-dry water years. Retail water supplies are comprised of regional water system supply, groundwater, recycled water, and non-potable water. Under normal hydrologic conditions, the total retail supply is projected to increase from 70.1 mgd in 2015 to 89.9 mgd in 2040. According to the 2015 plan, available and anticipated future water supplies would fully meet projected demand in San Francisco through 2040 during normal years.

On December 11, 2018, by Resolution No. 18-0212, the SFPUC amended its 2009 Water Supply Agreement between the SFPUC and its wholesale customers. That amendment revised the Tier 1 allocation in the *Water Supply Allocation Plan* to require a minimum reduction of 5 percent of the regional water system supply for San Francisco retail customers whenever system-wide reductions are required due to dry-year supply shortages.[94] When accounting for the requirements of this recently amended agreement, existing and planned supplies would meet projected retail water system demands in all years except for an approximately 3.6 to 6.4 mgd or 5.0 to 7.4 percent shortfall during dry years through the year 2040. The 6.8 percent shortfall is expected to occur during years seven and eight of the 8.5-year design drought based on 2040 demand levels. This relatively small shortfall is primarily due to

[90] California Water Code, division 6, part 2.6, sections 10610 through 10656, as last amended in 2015.
[91] SFPUC, 2015 UWMP.
[92] SFPUC, 2015 UWMP, Appendix E, Table 5, p. 21.
[93] Association of Bay Area Governments, Jobs-Housing Connection Strategy, May 2012.
[94] SFPUC, Resolution No. 18-0212, December 11, 2018.

implementation of the amended 2009 water supply agreement. In such an event, the SFPUC would implement the SFPUC's Retail Water Shortage Allocation Plan and could manage this relatively small shortfall by prohibiting certain discretionary outdoor water uses and/or calling for voluntary rationing among all retail customers. Based on experience in past droughts, retail customers could reduce water use to meet this projected level of shortfall. The required level of rationing is well below the SFPUC's regional water supply level of service goal of limiting rationing to no more than 20 percent on a system-wide basis.

Based on the 2015 Urban Water Management Plan, as modified by the 2018 amendment to the 2009 Water Supply Agreement, sufficient retail water supplies would be available to serve projected growth in San Francisco through 2040. While concluding that the supply is sufficient, the 2015 plan also identifies projects that are underway or planned to augment local supply. Projects that are underway or recently completed include the San Francisco Groundwater Supply Project and the Westside Recycled Water Project. A more current list of potential regional and local water supply projects that the SFPUC is considering is provided below under "Additional Water Supplies."

In addition, the 2015 plan describes the SFPUC's ongoing efforts to improve dry-year water supplies, including participation in Bay Area regional efforts to improve water supply reliability through projects such as interagency interties, groundwater management and recharge, potable reuse, desalination, and water transfers. While no specific capacity or supply has been identified, this program may result in future supplies that would benefit SFPUC customers.

2018 Bay-Delta Plan Amendment

In December 2018 the state water board adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (the Bay-Delta Plan Amendment). The amendments establish water quality objectives to maintain the health of the rivers and the Bay-Delta ecosystem.[95] Among the goals of the adopted Bay-Delta Plan Amendment is to increase salmonid populations in the San Joaquin River, its tributaries (including the Tuolumne River), and the Bay-Delta. Specifically, the plan amendment requires increasing flows in the Stanislaus, Tuolumne, and Merced rivers to 40 percent of unimpaired flow[96] from February through June every year, whether it is wet or dry. During dry years, this would result in a substantial reduction in the SFPUC's water supplies from the Tuolumne River watershed.

If the Bay-Delta Plan Amendment is implemented, the SFPUC would be able to meet the projected retail water demands presented in the 2015 plan in normal years but would experience supply shortages in single dry years and multiple dry years. Implementation of the Bay-Delta Plan Amendment would result in substantial dry-year water supply shortfalls throughout the SFPUC's regional water system service area, including San Francisco. The 2015 plan assumes limited rationing for retail customers may be needed in multiple dry years to address an anticipated supply

[95] State Water Resources Control Board Resolution No. 2018-0059, Adoption of Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document, December 12, 2018, *https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf*, accessed March 26, 2021.

[96] "Unimpaired flow" represents the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

shortage by 2040; the 2018 amendment to the 2009 Water Supply Agreement with wholesale customers would slightly increase rationing levels indicated in the 2015 plan. By comparison, implementation of the Bay-Delta Plan Amendment would result in supply shortfalls in all single dry years and multiple dry years and rationing to a greater degree than previously anticipated to address supply shortages not accounted for in the 2015 plan or as a result of the 2018 amendment to the 2009 Water Supply Agreement.

The state water board has stated that it intends to implement the plan amendment by the year 2022, assuming all required approvals are obtained by that time. However, at this time, the implementation of the Bay-Delta Plan Amendment is uncertain for several reasons, as described below.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in state and federal court, challenging the water board's adoption of the plan amendment, including legal challenges filed by the federal government at the request of the U.S. Bureau of Reclamation. That litigation is in the early stages, and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-executing and does not allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the plan amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, the Clean Water Act, section 401 certification process in the Federal Energy Regulatory Commission's relicensing proceeding for Don Pedro Dam. The license amendment process is currently expected to be completed in the 2022-2023 timeframe. This process and other regulatory and/or adjudicatory proceeding would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility for the Tuolumne River than currently exists (and therefore a different water supply effect on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the water board directed its staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River by March 1, 2019, and to incorporate such agreements as an 'alternative' for a future amendment to the Bay-Delta Plan to be presented to the [water board] as early as possible after December 1, 2019." In accordance with the water board's instruction, on March 1, 2019, the SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary agreement with the state water board that would serve as an alternative path to implementing the Bay-Delta Plan's objectives. On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support its participation in the voluntary agreement negotiation process. In a written progress report to the Voluntary Agreement Plenary Participants dated July 1, 2019, the California secretaries for Environmental Protection and for Natural Resources stated that the collective state agencies should be able "to determine the adequacy" of the various proposed voluntary agreements, including the proposed Tuolumne Voluntary Agreement, by October 15, 2019, and that if the state team recommends the voluntary agreements to the state water board, then (1) scientific peer review of the voluntary agreements would be completed by the spring of 2020, and (2) a draft CEQA document would be released for public comment in the summer of 2020, with a finalized CEQA document completed the following year. To date,

those negotiations are ongoing. Negotiations for the Tuolumne Voluntary Agreement continued beyond the October 15, 2019, date and are ongoing, pushing back the completion timeline anticipated in the July 1, 2019, letter. On February 4, 2020, the secretaries for Environmental Protection and for Natural Resources issued a presentation summarizing the framework of the voluntary agreement process that did not include new deadlines for completion.

For these reasons, whether, when, and the form in which the Bay-Delta Plan Amendment will be implemented, and how those amendments will affect the SFPUC's water supply, is currently unknown.

Additional Water Supplies

In light of the adoption of the Bay-Delta Plan Amendment and the resulting potential limitation to the SFPUC's regional water system supply during dry years, the SFPUC is expanding and accelerating its efforts to develop additional water supplies and explore other projects that would improve overall water supply resilience. Developing these supplies would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The SFPUC has taken action to fund the study of additional water supply projects, which are listed below:

- Daly City Recycled Water Expansion
- Alameda County Water District Transfer Partnership
- Brackish Water Desalination in Contra Costa County
- Alameda County Water District-Union Sanitary District Purified Water Partnership
- Crystal Springs Purified Water
- Eastside Purified Water
- San Francisco Eastside Satellite Recycled Water Facility
- Additional Storage Capacity in Los Vaqueros Reservoir from Expansion
- Calaveras Reservoir Expansion

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. One or more of these projects may require additional environmental review. These projects would take 10 to 30 or more years to implement and would require environmental permitting negotiations, which may reduce the amount of water that can be developed. The yield from these projects is unknown and not currently incorporated into SFPUC's supply projections.

In addition to capital projects, the SFPUC is also considering developing related water demand management policies and ordinances, such as funding for innovative water supply and efficiency technologies and requiring potable water offsets for new developments.

Water Supply Assessment

Under sections 10910 through 10915 of the California Water Code, urban water suppliers like the SFPUC must prepare water supply assessments for certain large "water demand" projects, as defined in CEQA Guidelines section

15155.[97] Water supply assessments rely on information contained in the water supplier's urban water management plan and on the estimated water demand of both the proposed project and projected growth within the relevant portion of the water supplier's service area. Because up to 575 residential units would be developed, the proposed project meets the definition of a water demand project under CEQA and requires a water supply assessment. The project-specific analysis of impacts on water supply facilities is provided below. Accordingly, the SFPUC approved a water supply assessment for the proposed project on October 27, 2020, and determined that it has adequate supplies to meet project demand.[98] Because the project variants would have similar, but slightly reduced, land use development programs as the proposed project (e.g., fewer residential units and reduced bus storage and maintenance) the conclusions for the proposed project related to Water Supply would also be applicable to the project variants.

The analysis of water supply capacity is based on review of SFPUC data on water supply (principally the commission's current 2015 Urban Water Management Plan); demand is calculated largely based on SFPUC-generated demand factors (furnished by SFPUC's district-scale non-potable water calculator version 6). The water supply assessment for the proposed project identifies the total water demand, including a breakdown of potable and non-potable water demands. The proposed project is subject to San Francisco's Non-potable Water Ordinance (article 12C of the San Francisco Health Code [health code]). The Non-potable Water Ordinance requires new commercial, mixed-use, and multi-family residential development projects with 250,000 square feet or more of gross floor area to install and operate an onsite non-potable water system. Such projects must meet their toilet and urinal flushing and irrigation demands through the collection, treatment, and use of available graywater, rainwater, and foundation drainage. While not required, projects may use treated blackwater or stormwater if desired. Furthermore, projects may choose to apply non-potable water to other non-potable water uses, such as cooling tower blowdown and industrial processes, but are not required to do so under the ordinance.

In 2026, when the proposed project would be in operation, the anticipated total water demand of the project would be 0.076 mgd (of which 0.028 mgd could be met by non-potable water). Accordingly, approximately 37 percent of the proposed project's total water demand would be met by non-potable water in 2040.

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[97] Pursuant to CEQA Guidelines section 15155(1), "a water-demand project" means:
(A) A residential development of more than 500 dwelling units.
(B) A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
(C) A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor area.
(D) A hotel or motel, or both, having more than 500 rooms,
(E) an industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
(F) a mixed-use project that includes one or more of the projects specified in subdivisions (a)(1)(A), (a)(1)(B), (a)(1)(C), (a)(1)(D), (a)(1)(E), and (a)(1)(G) of this section.
(G) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

[98] SFPUC, Water Supply Assessment for the Potrero Yard Modernization Project (2500 Mariposa Street), October 27, 2020, p. 19.

Future retail (citywide) water demand through 2040 is estimated based on the population and employment growth projections contained in the department's Land Use Allocation 2012. The department has determined that the proposed project represents a portion of the planned growth accounted for in the department's Land Use Allocation 2012. Therefore, the proposed project's demand is incorporated in the 2015 Urban Water Management Plan.

The proposed project's anticipated potable water demand of 0.048 mgd would contribute 0.05 percent to the projected total retail demand of 89.9 mgd in 2040. Similarly, the proposed project's total water demand of 0.076 mgd, which does not account for the 0.028 mgd savings anticipated through compliance with the Non-potable Water Ordinance, would represent 0.08 percent of the total retail demand in 2040. Thus, the proposed project represents a small fraction of the total projected water demand in San Francisco through 2040.

Due to the 2018 Bay-Delta Plan Amendment, the proposed project's water demand estimates are considered under three water supply scenarios. The ability of the water supply system to meet the demand of the proposed project, in combination with both existing development and projected growth in San Francisco, is evaluated under the following water supply scenarios:

- Scenario 1: Current Water Supply
- Scenario 2: Bay-Delta Plan Voluntary Agreement
- Scenario 3: 2018 Bay-Delta Plan Amendment

As discussed below, water supplies would be available to meet the demand of the proposed project in combination with both existing development and projected growth in San Francisco through 2040 under each of these water supply scenarios with varying levels of rationing during dry years.

SCENARIO 1 – CURRENT WATER SUPPLY

Scenario 1 assumes no change to the way in which water is supplied, and that neither the Bay-Delta Plan Amendment nor a Bay-Delta Plan Voluntary Agreement would be implemented. Thus, the water supply and demand assumptions contained in the 2015 plan and the 2009 Water Supply Agreement as amended would remain applicable for the proposed project. As stated above, the proposed project is accounted for in the demand projections in the 2015 plan.

Under Scenario 1, water supplies would be available to meet the demand of the proposed project in combination with existing development and projected growth in all years, except for an approximately 3.6 to 6.4 mgd or 5 to 7.4 percent shortfall during dry years through the year 2040. This relatively small shortfall is primarily due to implementation of the amended 2009 Water Supply Agreement. To manage a small shortfall such as this, the SFPUC may prohibit certain discretionary outdoor water uses and/or call for voluntary rationing by its retail customers. During a prolonged drought at the end of the 20-year planning horizon, the proposed project could be subject to voluntary rationing in response to a 7.4 percent supply shortfall, when the 2018 amendments to the 2009 Water Supply Agreement are taken into account. This level of rationing is well within the SFPUC's regional water system

supply level of service goal of limiting rationing to no more than 20 percent on a system-wide basis (i.e., an average throughout the regional water system).

SCENARIO 2 – BAY-DELTA PLAN VOLUNTARY AGREEMENT

Under Scenario 2, a voluntary agreement would be implemented as an alternative to the adopted Bay-Delta Plan Amendment. The March 1, 2019, proposed voluntary agreement submitted to the state water board has yet to be accepted, and the shortages that would occur with its implementation are not known. The voluntary agreement proposal contains a combination of flow and non-flow measures that are designed to benefit fisheries at a lower water cost, particularly during multiple dry years, than would occur under the Bay-Delta Plan Amendment. The resulting regional water system supply shortfalls during dry years would be less than those under the Bay-Delta Plan Amendment and would require rationing of a lesser degree and closer in alignment to the SFPUC's adopted level of service goal for the regional water system of rationing of no more than 20 percent system-wide during dry years. SFPUC Resolution No. 19-0057, which authorized the SFPUC staff to participate in voluntary agreement negotiations, stated its intention that any final voluntary agreement allow the SFPUC to maintain both the water supply and sustainability level of service goals and objectives adopted by the SFPUC when it approved the WSIP. Accordingly, it is reasonable to conclude that if the SFPUC enters into a voluntary agreement, the supply shortfall under such an agreement would be of a similar magnitude to those that would occur under Scenario 1. In any event, the supply shortfall of water supplies would be of a similar magnitude to those that would occur under Scenario 1. Rationing under Scenario 2, with implementation of the voluntary agreement, would be to a lesser degree than that under Scenario 3, with implementation of the Bay-Delta Plan Amendment as adopted.

SCENARIO 3 – BAY-DELTA PLAN AMENDMENT

Under Scenario 3, the 2018 Bay-Delta Plan Amendment would be implemented as it was adopted by the state water board without modification. As discussed above, there is considerable uncertainty whether, when, and in what form the plan amendment will be implemented. However, because implementation of the plan amendment cannot be ruled out at this time, an analysis of the cumulative impact of projected growth on water supply resources under this scenario is included in this document to provide a worst-case impact analysis.

Under this scenario, which is assumed to be implemented after 2022, water supplies would be available to meet projected demands through 2040 in wet and normal years with no shortfalls. However, under Scenario 3 the entire regional water system—including both the wholesale and retail service areas—would experience significant shortfalls in single dry and multiple dry years, which over the past 97 years occur on average just over once every 10 years. Significant dry-year shortfalls would occur in San Francisco, regardless of whether the proposed project is approved and constructed. Except for the currently anticipated shortfall to retail customers of about 6.1mgd (6.8 percent) that is expected to occur under Scenario 1 during years seven and eight of the 8.5-year design drought based on 2040 demand levels, these shortfalls to retail customers would exclusively result from supply reductions resulting from implementation of the Bay-Delta Plan Amendment. The retail supply shortfalls under this scenario would not be attributed to the incremental demand associated with the proposed project, because this demand is incorporated already in the growth and water demand/supply projections contained in the 2015 plan.

Under the Bay-Delta Plan Amendment, existing and planned dry-year supplies would be insufficient for the SFPUC to satisfy its regional water system supply level of service goal of no more than 20 percent rationing system-wide. The SFPUC's Water Shortage Allocation Plan does not specify allocations to retail supply during system-wide shortages above 20 percent. However, the plan indicates that if a system-wide shortage greater than 20 percent were to occur, regional water system supply would be allocated between retail and wholesale customers per the rules corresponding to a 16 to 20 percent system-wide reduction, subject to consultation and negotiation between the SFPUC and its wholesale customers to modify the allocation rules. These allocation rules result in shortfalls of 15.6 to 49.8 percent across the retail service area as a whole under Scenario 3, from 2025 through 2040. Total shortfalls under Scenario 3 would range from 12.3 mgd (15.6 percent) in a single dry year to 36.1 mgd (45.7 percent) in years seven and eight of the 8.5-year design drought based on 2025 demand levels and from 21 mgd (23.4 percent) in a single dry year to 44.8 mgd (49.8 percent) in years seven and eight of the 8.5-year design drought based on 2040 demand.[99]

Impact Analysis

As described above, the supply capacity of the Hetch Hetchy regional water system that provides the majority of the City's drinking water far exceeds the potential demand of any single development project in San Francisco. No single development project alone in San Francisco would require the development of new or expanded water supply facilities or require the SFPUC to take other actions, such as imposing a higher level of rationing across the City in the event of a supply shortage in dry years. Therefore, a separate project-only analysis is not provided for this topic. The following analysis instead considers whether the proposed project, in combination with both existing development and other projected growth through 2040, would require new or expanded water supply facilities, the construction or relocation of which could have significant cumulative impacts on the environment. It also considers whether a high level of rationing would be required that could have significant cumulative impacts. It is only under this cumulative context that development in San Francisco could have the potential to require new or expanded water supply facilities or require the SFPUC to take other actions, which in turn could result in significant physical environmental impacts related to water supply. If significant cumulative impacts could result, then the analysis considers whether the proposed project would make a considerable contribution to the cumulative impact.

IMPACTS RELATED TO NEW OR EXPANDED WATER SUPPLY FACILITIES

The SFPUC's adopted water supply level of service goal for the regional water system is to meet customer water needs in non-drought and drought periods. The system performance objective for drought periods is to meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in regional water service during extended droughts. As the SFPUC has designed its system to meet this goal, it is reasonable to assume that to the extent the SFPUC can achieve its service goals, sufficient supplies would be available to serve existing development and planned growth accounted for in the 2015 plan (which includes the proposed project) and that new or expanded water supply facilities are not needed to meet system-wide demand. While the focus of this

[99] Technical Memorandum from Steven Ritchie, SFPUC Water Enterprise, to Lisa Gibson, San Francisco Planning Department, May 31, 2019, Table 3, p. 10.

analysis is on the SFPUC's retail service area and not the regional water system as a whole, this cumulative analysis considers the SFPUC's regional water supply level of service goal of rationing of not more than 20 percent in evaluating whether new or expanded water supply facilities would be required to meet the demands of existing development and projected growth in the retail area through 2040. If a shortfall would require rationing more than 20 percent to meet system-wide dry-year demand, the analysis evaluates whether, as a result, the SFPUC would develop new or expanded water supply facilities that result in significant physical environmental impacts. It also considers whether such a shortfall would result in a level of rationing that could cause significant physical environmental impacts. If the analysis determines that there would be a significant cumulative impact, then per CEQA Guidelines section 15130, the analysis considers whether the project's incremental contribution to any such effect is "cumulatively considerable."

Existing and planned dry-year supplies would meet projected retail demands through 2040 under Scenario 1 within the SFPUC's regional water system adopted water supply reliability level of service goal. Therefore, the SFPUC could meet the water supply needs for the proposed project, in combination with existing development and other projected growth in San Francisco through 2040, from the SFPUC's existing system. The SFPUC would not be expected to develop new or expanded water supply facilities for retail customers under Scenario 1 and there would be no significant cumulative environmental impact.

The effect of Scenario 2 cannot be quantified at this time, but as explained previously, if it can be designed to achieve the SFPUC's level of service goals and is adopted, it would be expected to have effects similar to Scenario 1. Given the SFPUC's stated goal of maintaining its level of service goals under Scenario 2, it is expected that Scenario 2 effects would be more similar to Scenario 1 than to Scenario 3. In any event, any shortfall effects under Scenario 2 that exceed the SFPUC's service goals would be expected to be less than those under Scenario 3. Therefore, the analysis of Scenario 3 would encompass any effects that would occur under Scenario 2 if it were to trigger the need for increased water supply or rationing in excess of the SFPUC's regional water system level of service goals.

Under Scenario 3, the SFPUC's existing and anticipated water supplies would be sufficient to meet the demands of existing development and projected growth in San Francisco, including the proposed project, through 2040 in wet and normal years, which have historically occurred in approximately nine out of 10 years on average. During dry and multiple dry years, retail supply shortfalls of 15.6 to 49.8 percent could occur.

As a result of the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations on supply to the regional water system during dry years, the SFPUC is increasing and accelerating its efforts to develop additional water supplies and explore other projects that would increase overall water supply resilience. The SFPUC is beginning to study water supply options, but it has not determined the feasibility of the possible projects, has not made any decision to pursue any particular supply projects, and has determined that any identified potential projects would take anywhere from 10 to 30 years or more to implement.

There is also a substantial degree of uncertainty associated with the implementation of the Bay-Delta Plan Amendment and its ultimate outcome; and therefore, there is substantial uncertainty in the amount of additional

water supply that may be needed, if any. Moreover, there is uncertainty and lack of knowledge as to the feasibility and parameters of the possible water supply projects the SFPUC is beginning to explore. Consequently, the physical environmental impacts that could result from future supply projects is quite speculative at this time and would not be expected to be reasonably determined for a period of time ranging from 10 to 30 years. Although it is not possible at this time to identify the specific environmental impacts that could result, this analysis assumes that if new or expanded water supply facilities, such as those listed above under "Additional Water Supplies," were developed, the construction and/or operation of such facilities could result in significant adverse environmental impacts, and that this would be a significant cumulative impact.

As discussed above, in 2040 the proposed project would represent 0.08 percent of total retail water demand and 0.05 percent of total potable water demand in San Francisco, whereas implementation of the Bay-Delta Plan Amendment would result in a retail supply shortfall of up to 49.8 percent. Thus, new or expanded dry-year water supplies would be needed under Scenario 3 regardless of whether the proposed project is approved or constructed. As such, any physical environmental impacts related to the construction and/or operation of new or expanded water supplies would occur with or without the proposed project. Therefore, the proposed project would not have a considerable contribution to any significant cumulative impacts that could result from the construction or operation of new or expanded water supply facilities developed in response to the Bay-Delta Plan Amendment.

IMPACTS RELATED TO RATIONING

Given the long lead times associated with developing additional water supplies, in the event the Bay-Delta Plan Amendment were to take effect sometime after 2022 and result in a dry-year shortfall, the expected action of the SFPUC for the next 10 to 30 years (or more) would be limited to requiring increased rationing. The remaining analysis therefore focuses on whether rationing at the levels that might be required under the Bay-Delta Plan Amendment could result in any cumulative impacts, and if so, whether the proposed project would make a considerable contribution to these impacts.

The SFPUC has established a process through its Retail Water Shortage Allocation Plan for actions it would take under circumstances requiring rationing. Rationing at the level that might be required under the Bay-Delta Plan Amendment would require changes to how businesses operate, changes to water use behaviors (e.g., shorter and/or less-frequent showers), and restrictions on irrigation and other outdoor water uses (e.g., car washing), all of which could lead to undesirable socioeconomic effects. Any such effects would not constitute physical environmental impacts under CEQA.

High levels of rationing could, however, lead to adverse physical environmental effects, such as the loss of vegetation cover resulting from prolonged restrictions on irrigation. Prolonged high levels of rationing within the City could also make San Francisco a less desirable location for residential and commercial development compared to other areas of the state not subject to such substantial levels of rationing, which, depending on location, could lead in turn to increased urban sprawl. Sprawl development is associated with numerous environmental impacts, including, for example, increased greenhouse gas emissions and air pollution from longer commutes and lower density development, higher energy use, loss of farmland, and increased water use from less water-efficient

suburban development.[100] In contrast, as discussed in the EIR Section 3.C, Transportation and Circulation, the project site is located in an area where VMT per capita is well below the regional average; development projects in San Francisco are required to comply with numerous regulations that would reduce greenhouse gas emissions, as discussed in initial study Section E.9, Greenhouse Gas Emissions, and San Francisco's per capita water use is among the lowest in the state. Thus, the higher levels of rationing on a citywide basis that could be required under the Bay-Delta Plan Amendment could lead directly or indirectly to significant cumulative impacts. The question, then, is whether the proposed project would make a considerable contribution to impacts that may be expected to occur in the event of high levels of rationing.

While the levels of rationing described above apply to the retail service area as a whole (i.e., 5 to 7.4 percent under Scenario 1, 15.6 to 49.8 percent under Scenario 3), the SFPUC may allocate different levels of rationing to individual retail customers based on customer type (e.g., dedicated irrigation, single-family residential, multi-family residential, commercial, etc.) to achieve the required level of retail (citywide) rationing. Allocation methods and processes that have been considered in the past and may be used in future droughts are described in the SFPUC's current Retail Water Shortage Allocation Plan.[101] However, additional allocation methods that reflect existing drought-related rules and regulations adopted by the SFPUC during the recent drought are more pertinent to current and foreseeable development and water use in San Francisco and may be included in the SFPUC's update to its Retail Water Shortage Allocation Plan.[102] The Retail Water Shortage Allocation Plan will be updated as part of the 2020 Urban Water Management Plan update in 2021. The SFPUC anticipates that the updated Retail Water Shortage Allocation Plan would include a tiered allocation approach that imposes lower levels of rationing on customers who use less water than other customers in the same customer class and would require higher levels of rationing by customers who use more water. This approach aligns with the state water board's statewide emergency conservation mandate imposed during the recent drought, in which urban water suppliers who used less water were subject to lower reductions than those who used more water. Imposing lower rationing requirements on customers who already conserve more water is also consistent with the implementation of prior rationing programs based on past water use in which more efficient customers were allocated more water.

The SFPUC anticipates that, as a worst-case scenario under Scenario 3, the multi-family mixed-use residential and commercial land uses that would be developed under the proposed project as well as the transit facility uses and its associated operation and maintenance uses could be subject to up to 38 percent rationing during a severe drought.[103] In accordance with the Retail Water Shortage Allocation Plan, the level of rationing that would be imposed on individual development projects/customers would be determined at the time of a drought or other

[100] According to the SFPUC's 2015 UWMP update, San Francisco's per capita water use is among the lowest in the state.

[101] SFPUC, 2015 UWMP, Appendix L – Retail Water Shortage Allocation Plan, June 2016.

[102] SFPUC, 2015-2016 Drought Program, adopted by Resolution 15-0119, May 26, 2015.

[103] This worst-case rationing level for San Francisco multi-family residential was estimated for the purpose of preparing comments on the Draft Substitute Environmental Document in Support of Potential Changes to the Bay-Delta Plan (SED), dated March 16, 2017. See comment letter Attachment 1, Appendix 3, Page 5, Table 3. The comment letter and attachments are available at *https://www.waterboards.ca.gov/public_notices/comments/2016_baydelta_plan_amendment/docs/dennis_herrera.pdf*, accessed March 26, 2021.

water shortage and cannot be established with certainty prior to the shortage event. However, the newly constructed building, such as the proposed project, would have water-efficient fixtures and non-potable water systems that comply with the latest regulations. Thus, if the proposed building's multi-family residential and transit uses demonstrate below-average water use, either of them would likely be subject to a lower level of rationing than other retail customers that meet or exceed the average water use for the same customer class.

While any substantial reduction in water use in a new, water-efficient building likely would require behavioral changes by building occupants that are inconvenient, temporary rationing during a drought is expected to be achievable through actions that would not cause or contribute to significant environmental effects. The effect of such temporary rationing would likely cause occupants to change behaviors but would not cause the substantial loss of vegetation because vegetation on this urban infill site would be limited to ornamental landscaping, and non-potable water supplies would remain available for landscape irrigation and bus wash stations in dry years. The proposed project would consist of an expanded transit facility and multi-family residential uses along with some commercial uses, and it is not anticipated to include uses that would be forced to relocate because of temporary water restrictions, such as a business that relies on significant volumes of water for its operations. While high levels of rationing that would occur under Scenario 3 could result in future development locating elsewhere, existing and future SFMTA employees and operations as well as future residents, workers, and businesses within the project site would be expected to tolerate rationing for the temporary duration of a drought.

As discussed above, implementation of the Bay-Delta Plan Amendment would result in substantial system-wide water supply shortfalls in dry years. These shortfalls would occur with or without implementation of the proposed project. The proposed project's incremental increase in potable water demand (0.05 percent of total retail demand in 2040) would have a negligible effect on the levels of rationing that would be required throughout San Francisco under Scenario 3 in dry years.

As such, temporary rationing that could be imposed on the proposed project would not cause or contribute to significant environmental effects associated with the high levels of rationing that may be required on a citywide basis under Scenario 3, even if that rationing is more frequent due to the effects of climate change. Thus, the proposed project would not make a considerable contribution to any significant cumulative impacts that may result from increased rationing that may be required with implementation of the Bay-Delta Plan Amendment, were it to occur.

As stated above, there is considerable uncertainty as to whether the Bay-Delta Plan Amendment will be implemented. If the plan amendment is implemented, the SFPUC will need to impose higher levels of rationing than its regional water system level of service goal of no more than 20 percent rationing during drought years by 2025 and for the next several decades. Implementation of the plan amendment would result in a dry year shortfall beginning in 2025 ranging from 15.6 percent in a single dry year and year one of multiple dry years to up to 45.7 percent in years seven and eight of the 8.5-year design drought; and dry-year shortfalls by 2040 ranging from 23.4 percent in a single dry year and year one of multiple dry years to up to 49.8 percent in years seven and eight of the 8.5-year design drought. While the SFPUC may seek new or expanded water supply facilities, it has not made

any definitive decision to pursue particular actions and there is too much uncertainty associated with this potential future decision to identify environmental effects that would result. Such effects are therefore currently speculative. In any case, the need to develop new or expanded water supplies in response to the Bay Delta Plan Amendment and any related environmental impacts would occur irrespective of the water demand associated with the proposed project. Given the long lead times associated with developing additional supplies, the SFPUC's expected response to implementation of the Bay-Delta Plan Amendment would be to ration in accordance with procedures in its Retail Water Shortage Allocation Plan.

Both direct and indirect environmental impacts could result from high levels of rationing. However, the proposed development is the expansion and modernization of an existing transit use on an urban infill site with integrated residential and commercial uses within one building, and, as such, would be expected to tolerate the levels of rationing imposed on those uses for the duration of the drought. Thus, it would not contribute to sprawl development as a result of rationing under the Bay-Delta Plan Amendment. Furthermore, the proposed project would be subject to the requirements of the Non-potable Water Ordinance, and, as a result, would not be expected to contribute to a loss of vegetation because project-generated non-potable supplies would remain available for irrigation in dry years. The small increase in potable water demand attributable to the proposed project compared to citywide demand would not substantially affect the levels of dry-year rationing that would otherwise be required throughout the City. Thus, the proposed project would not make a considerable contribution to a cumulative environmental impact caused by implementation of the Bay-Delta Plan Amendment. Therefore, for the reasons described above, under all three scenarios, this impact would be considered less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Wastewater Capacity

Impact UT-3: Implementation of the proposed project or project variants would not result in a determination by the wastewater treatment provider which serves the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. (*Less than Significant*)

The project site is located in the Channel subdrainage area of the Bayside Drainage Basin, also called the Channel watershed,[104] and is served by San Francisco's combined sewer system, which collects, transports, and treats sanitary sewage and stormwater runoff in the same facilities prior to discharge to federal and state waters (i.e., San Francisco Bay).[105] As stated above on p. 55, wastewater and stormwater generated by the proposed project or project variants would be treated at the Southeast Water Pollution Control Plant, which currently treats 60 mgd of wastewater and has the capacity to treat up to 250 mgd during a rainstorm. Discharges to federal and state waters from the water pollution control plant are permitted under Bayside National Pollutant Discharge Elimination

[104] SFPUC, Sewer System Improvements Fact Sheet, *http://sfwater.org/modules/showdocument.aspx?documentid=10762*, accessed March 26, 2021.

[105] San Francisco is roughly divided into two major drainage areas: the Bayside and Westside Basins, which are further divided into eight subdrainage areas. SFPUC, Draft San Francisco Sewer System Improvement Program Report, August 10, 2010, Figure 1. San Francisco Major Drainage Basins and Wastewater Facilities, p. 2, *https://www.sfwater.org/modules/showdocument.aspx?documentid=984*, accessed March 26, 2021.

System Permit No. CA0037664 (Bayside NPDES Permit),[106] issued and enforced by the San Francisco Bay Regional Water Quality Control Board (regional water board).

Construction

Construction of the proposed project or project variants would remove and replace approximately 192,000 square feet of impervious surface and would involve demolition, excavation (approximately 248,900 cubic yards), site preparation, and construction that would occur over a period of approximately three to four years, with construction beginning early 2023 (see EIR Chapter 2, Project Description, p. 2.54). If excavation occurs when groundwater is elevated to the design high-groundwater level of 20 feet below ground surface, groundwater discharges would be subject to public works code article 4.1 (Industrial Waste Ordinance),[107] as supplemented by public works order no. 158170,[108] which regulates the quantity and quality of discharges to the combined sewer system. Additionally, construction contractors would be required to implement an erosion and sediment control plan for construction activities in accordance with public works code article 4.2 (Sewer System Management)[109] and the General Construction Stormwater Permit to reduce the impacts of runoff from the construction site (discussed in more detail under Impact HY-1 in initial study Section E.17, Hydrology and Water Quality, pp. 114115. During construction, workers would use portable toilets and hand-washing facilities for their sanitary needs and there would be no related wastewater discharges to the combined sewer system. Therefore, there would be minimal flows to the combined sewer system, and impacts related to exceeding the wastewater treatment capacity of the Southeast Water Pollution Control Plant during construction would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Operation

Under existing conditions, 100 percent of the project site is covered by impermeable surfaces, including the existing maintenance and operations building and bus storage yard. There is no landscaping or landscaped open space on the project site. There are approximately 400 employees associated with current SFMTA uses at the site, including 295 bus operators.

[106] San Francisco Regional Water Quality Control Board, Waste Discharge Requirements for the Southeast Water Pollution Control Plant, North Point Wet Weather Facility and Bayside Wet Weather Facilities and Wastewater Collection System, Order No. R2-2013-0029, NPDES No. CA0037664, adopted August 2013, *https://www.waterboards.ca.gov/rwqcb2/board_decisions/adopted_orders/2013/R2-2013-0029.pdf*, accessed March 26, 2021.

[107] San Francisco Public Works Code, Article 4.1, Industrial Waste, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-441*, accessed March 26, 2021.

[108] City and County of San Francisco, San Francisco Department of Public Works Order No. 158170, Industrial Waste Discharge Limits into City's Sewerage System, 2008, *https://infrastructure.sfwater.org/fds/fds.aspx?lib=SFPUC&doc=619040&data=238330400*, accessed March 26, 2021.

[109] San Francisco Public Works Code, Article 4.2, Sewer System Management, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-778*, accessed March 26, 2021.

As discussed above under Impact UT-1, compliance with the Stormwater Management Ordinance and Stormwater Management Requirements and Design Guidelines[110] would require project operations to reduce the existing volume and rate of stormwater runoff discharged from the project site through appropriate stormwater management systems. These could include a stormwater holding tank (or system of tanks) to collect and detain stormwater runoff onsite and rainwater catchment systems. As currently proposed, the project would detain 100 percent of the stormwater onsite and use it as a non-potable water supply for the bus wash and irrigation system. Stormwater and recycled water from the bus wash system would be pre-treated to draw out pollutants, reduce peak flow, and recharge groundwater.[111] During the final design, the project team will determine the size of the stormwater holding tank needed to keep the bus wash and irrigation system supplied with non-potable water. If rainwater harvesting, collection, and reuse is feasible, a centralized storage tank and onsite distribution system would provide another source of non-potable water for vehicle maintenance/cleaning, toilet flushing, and irrigation.

All industrial waste from the replacement transit facility use will drain to an appropriately sized oil/water interceptor prior to connecting to the combined sewer system. The onsite stormwater system will consist of area drains, roof drains and overflow drains, and reclaimed water will be used for landscaping, as required per the green building code amendments and GS6 Form for municipal projects.[112] Used oil and coolants drained from vehicles would be collected in mobile receptacles. Diaphragm pumps located in the maintenance area would be used to pump used fluid into specific storage tanks. Full tanks would be collected and transported offsite by a registered hazardous waste materials transport company.[113] Therefore, oil and other industrial waste from the replacement transit facility would not enter the offsite storm drain system. Hazardous waste materials management is discussed further under Impact HZ-1 in initial study Section E.18, Hazards and Hazardous Materials (pp. 121124.

As discussed above, the combined sewer system is sized to accommodate both daily wastewater flows and stormwater runoff from a five-year storm; therefore, wastewater is a small component of the design flow. Most of the flow during wet weather events comes from stormwater runoff. The water supply assessment estimated that the proposed project would require approximately 17,461,000 gallons of potable water per year, or 47,838 gallons per day.[114] Therefore, assuming the historical water to wastewater ratio where wastewater constitutes approximately 95 percent of water consumption by existing uses, the proposed project would consume approximately 3,500 gallons per day of potable water.[115,116] An increase of 44,338 gallons per day of wastewater over existing conditions would not be substantial. The proposed project or project variants would represent a 0.07 percent

[110] SFPUC, San Francisco Stormwater Management Requirements and Design Guidelines, May 2016, *https://sfwater.org/Modules/ShowDocument.aspx?documentID=9026*, accessed March 26, 2021.

[111] Design Criteria Document, Version 2, pp. 35-36.

[112] Design Criteria Document, Version 2, p. 47.

[113] Design Criteria Document, Version 2, p. 57.

[114] SFPUC, Water Supply Assessment for the Potrero Yard Modernization Project (2500 Mariposa Street), October 27, 2020, Attachment B: 2500 Mariposa Street/SFMTA Potrero Bus Yard Project Demand Memo, September 16, 2020, p. 6.

[115] City of County of San Francisco, 2030 Wastewater Master Plan, Task 100 Technical Memorandum No. 102, Wastewater Flow and Load Projections, Final Draft, August 2009, pp. 102- to 102-7, *http://www.sfwater.org/modules/showdocument.aspx?documentid=607*, accessed March 26, 2021.

[116] SFPUC, Water Supply Assessment for the Potrero Yard Modernization Project (2500 Mariposa Street), October 27, 2020, Attachment B – 2500 Mariposa Street/SFMTA Potrero Bus Yard Project Demand Memo, September 16, 2020, p. 4.

increase in the Southeast Water Pollution Control Plant's dry-weather flow treatment capacity of 60,000,000 gallons per day and an even smaller percentage of the 250,000,000-gallon-per-day wet-water treatment capacity. The Southeast Water Pollution Control Plant would be able to accommodate increase flows from the proposed project as well as existing commitments. Therefore, impacts related to exceeding the wastewater treatment capacity of the Southeast Water Pollution Control Plant during operation would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Solid Waste

Impact UT-4: The proposed project or project variants would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. (*Less than Significant*)

Recology, Inc. currently provides residential and commercial solid waste collection, recycling, and disposal services for the City of San Francisco. Recyclable materials are taken to Recology's Pier 96 facility, where they are separated into commodities (e.g., aluminum, glass, and paper) and transported to other users for reprocessing. Compostables (e.g., food waste, plant trimmings, soiled paper) are transferred to a Recology composting facility in Solano County, where they are converted to soil amendment and compost. The remaining material that cannot otherwise be reprocessed (trash) is primarily transported to a landfill.

In September 2015, the City entered into a landfill disposal agreement with Recology, Inc. for disposal of all solid waste collected in San Francisco, at the Recology Hay Road Landfill northeast of Vacaville in Solano County for nine years or until 3.4 million tons have been disposed, whichever occurs first. The City would have an option to renew the agreement for a period of six years or until an additional 1.6 million tons have been disposed, whichever occurs first.[117] The Recology Hay Road Landfill is permitted to accept up to 2,400 tons per day of solid waste, and at that maximum rate of acceptance, the landfill has permitted remaining capacity of 30,433,000 cubic yards and is expected to continue to receive waste approximately through the year 2077.[118] The City's contract with the Recology Hay Road Landfill is set to terminate in 2031 (at the end of the six-year optional renewal) or when 5 million tons have been disposed, whichever occurs first. At that point, the City will either further extend the Recology Hay Road Landfill contract or find and entitle another landfill site. In 2018, San Francisco generated a total of about 740,000 tons of landfill waste (approximately 2,027 average tons per day), approximately 450,000 tons of which were directed to the Hay Road Landfill and the remaining 290,000 tons received at roughly 23 other landfills, with Altamont, Corinda Los Trancos, and the Potrero Hills landfills receiving most of this remaining volume.[119]

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[117] San Francisco Planning Department, Case No 2014.0653E, Notice of Availability of and Intent to Adopt a Negative Declaration for the Agreement for Disposal of San Francisco Municipal Solid Waste at Recology Hay Road Landfill in Solano County, March 4, 2015 and Agreement for Disposal of San Francisco Municipal Solid Waste at Recology Hay Road Landfill in Solano County Final Negative Declaration, July 21, 2015, *http://sfmea.sfplanning.org/2014.0653E_Revised_FND.pdf*, accessed March 26, 2021.

[118] California Department of Resources Recycling and Recovery (CalRecycle), Solid Waste Information System (SWIS) Facility Detail, Recology Hay Road, *https://www2.calrecycle.ca.gov/swfacilities/Directory/48-AA-0002*, accessed March 26, 2021.

[119] CalRecycle, Disposal Reporting System, Jurisdiction Disposal by Facility, San Francisco, 2018, *https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility*, accessed March 26, 2021.

Construction

Construction and demolition debris must be transported by a registered transporter to a registered facility that can process mixed construction and demolition debris pursuant to the City and County of San Francisco Construction and Demolition Ordinance. The ordinance requires that at least 65 percent of construction and demolition debris from a site go to a registered construction and demolition recycling facility. This requirement has been augmented by the Green Building Ordinance, which requires that at least 75 percent of construction and demolition debris be diverted from landfills.

Over the three- to four-year construction duration, demolition and construction activities would generate construction debris at the project site, some of which would require disposal. The project would be subject to the City's various solid waste diversion requirements, including the San Francisco Construction and Demolition Debris Recovery Ordinance, the 2019 Green Building Ordinance (enforced by the San Francisco Department of Building Inspection [department of building inspection]), and Title 24 of the California Code of Regulations. Compliance with these mandatory diversion requirements would require construction debris generated because of project implementation would not exceed permitted landfill capacity.

Operation

To minimize solid waste disposal volumes and maximize recycling, San Francisco Ordinance No. 100-09 (the Mandatory Recycling and Composting Ordinance) requires all San Francisco residents and commercial landlords to separate their refuse into recyclables, compost, and trash. During operation, the proposed project or project variants would be subject to this ordinance. Although the proposed project or project variants would increase total solid waste generation from the City by increasing the number of residents and employees at the project site, the increasing rate of diversion through recycling and other methods would result in a decreasing share of total waste that requires deposition into the landfill.

Operation of the proposed project or project variants would increase generation of solid waste and recyclables at the project site compared to existing conditions. According to CalRecycle, in 2018 San Francisco residents generated approximately 4.6 pounds of solid waste for disposal in a landfill per resident per day, while commercial uses generated approximately 5.6 pounds for disposal in a landfill per employee per day.[120] Based on the existing waste generation rates, the proposed project or project variants would be expected to generate a net increase of approximately 5,710 pounds of solid waste per day.[121] This volume would represent 0.14 percent of the 2018 San Francisco-generated landfill waste of 2,027 tons per day, and 0.12 percent of the Hay Road Landfill's 2,400-ton maximum daily throughput. Furthermore, the Hay Road Landfill has a remaining capacity of over 30.4 million cubic yards, with an anticipated closure in 2077, and therefore can accommodate solid waste disposal needs of the project through the duration of the proposed project.

[120] CalRecycle, Disposal Rate Calculator, San Francisco, 2018, *https://www2.calrecycle.ca.gov/LGCentral/AnnualReporting/DisposalRateCalculator,* accessed March 26, 2021.

[121] The volume of waste generated for the proposed project is the based on the following: (575 new residents × 4.6 pounds/day) + (548 net new employees x 5.6 pounds/day) = 5,713.8 net new pounds/day.

Although the proposed project or project variants would incrementally increase total waste generation from the City, given the City's progress to date on diversion and waste reduction and the existing future long-term capacity available at the Recology Hay Road Landfill, solid waste generated as a result of construction and operation of the proposed project or project variants would not result in the landfill exceeding its permitted capacity. Therefore, the proposed project or project variants would be served by landfills with sufficient permitted capacity to accommodate its solid waste disposal needs and impacts would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact UT-5: Construction and operation of the proposed project or project variants would comply with all applicable statutes and regulations related to solid waste. (*Less than Significant*)

The California Integrated Waste Management Act of 1989 requires municipalities to adopt an integrated waste management plan to establish objectives, policies, and programs related to waste disposal, management, source reduction, and recycling.

Reports filed by the San Francisco Department of the Environment show that the City generated approximately 873,000 tons of waste material in 2000. By 2018 that figure decreased to approximately 740,000 tons, despite growth in population and employment.[122] Solid waste diverted from landfills is defined as recycled or composted. In 2018, the City committed to zero waste goals that reduce solid waste generation by 15 percent by 2030 (including recycling, compost, and trash) and that would reduce disposal to landfill and incineration by 50 percent by 2030.[123]

San Francisco Ordinance No. 27-06 requires a minimum of 65 percent of construction and demolition debris to be recycled and diverted from landfills. The green building code also requires certain projects to submit a Recovery Plan to the San Francisco Department of the Environment demonstrating recovery or diversion of at least 75 percent of all demolition debris. Additionally, the Mandatory Recycling and Composting Ordinance requires everyone in the City to separate their refuse into recyclables, compost, and trash. Furthermore, the Recology Hay Road Landfill and other landfills that serve the City are required to meet federal, state, and local solid waste regulations. The proposed project or project variants would comply with the solid waste disposal policies and regulations identified above. Impacts related to compliance with solid waste statutes and regulations would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

[122] CalRecycle, Disposal Reporting System, Jurisdiction Disposal by Facility, San Francisco, 2000 and 2018, *https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility*, accessed March 26, 2021.

[123] San Francisco Department of the Environment, Mayor London Breed Challenges Cities, States and Regions Around the World to Join San Francisco in Setting Aggressive Sustainability Goals, September 2018, *https://sfenvironment.org/press-release/mayor-london-breed-challenges-cities-states-and-regions-around-the-world-to-join-san-francisco-in-setting-aggressive-sustainability*, accessed March 26, 2021.

Cumulative Impacts

Impact C-UT-1: The proposed project or project variants, in combination with cumulative projects, would not result in significant cumulative impacts on utilities and service systems. (*Less than Significant*)

Wastewater and Stormwater

The geographic context for cumulative wastewater and stormwater impacts is the Southeast Water Pollution Control Plant drainage basin. The City's combined sewer system and treatment facilities are designed to accept both wastewater and stormwater flows. As with the proposed project, all cumulative projects in the drainage basin would be required to comply with San Francisco regulations regarding wastewater and stormwater generation. Although cumulative projects would likely result in increased wastewater flows, regulations require that, for projects replacing 5,000 square feet or more of impervious surface, stormwater flows be reduced by 25 percent over existing conditions. The 25 percent reduction in stormwater flows would result in an overall reduction in combined flows during peak wet-weather flow events. Therefore, the proposed project or project variants, in combination with cumulative projects, would have a less-than-significant cumulative impact on the combined sewer collection and treatment system.

Water Supply

As discussed in Impact UT-2, no single development project alone in San Francisco would require the development of new or expanded water supply facilities. The analysis provided in Impact UT-2 considers whether the proposed project, in combination with both existing development and projected growth through 2040, would require new or expanded water supply facilities, the construction or relocation of which could have significant cumulative impacts on the environment. Therefore, no separate cumulative analysis is required.

Solid Waste

The geographic context for cumulative solid waste impacts is the City. Long-range growth forecasts are considered in planning for future landfill capacity. In addition, the City currently exceeds statewide goals for reducing solid waste and is therefore expected to reduce solid waste volumes in the future. All projects are required to comply with San Francisco's construction and demolition debris recovery and recycling and composting ordinances. As with the proposed project, compliance with these ordinances would reduce the solid waste generation from construction and operation of cumulative projects.

Although cumulative projects could incrementally increase total waste generation from the City by increasing the number of residents and excavation, demolition, and remodeling activities associated with growth, the increasing rate of landfill diversion citywide through recycling, composting, and other methods would result in a decrease of total waste that requires deposition into the landfill. Given the City's progress to date on diversion and waste reduction and given the future long-term capacity available at the Recology Hay Road Landfill and other area landfills, cumulative projects would be served by a landfill with sufficient permitted capacity to accommodate their solid waste disposal needs. For these reasons, the proposed project, in combination with cumulative projects, would have less-than-significant cumulative impacts related to solid waste.

Based on the above, the proposed project or project variants would not combine with cumulative projects to create a significant cumulative impact on utilities and service systems, and mitigation measures are not required. This topic will not be discussed in the EIR.

E.14 Public Services

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
14. PUBLIC SERVICES. Would the project:					
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, police protection, schools, parks, or other public facilities?	☐	☐	☒	☐	☐

Summary of Public Services Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to public services (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

The impacts of the proposed project or project variants on parks are discussed above under initial study Section E.12, Recreation. Impacts on other public services are discussed below.

Impact PS-1: The proposed project or project variants would increase demand for fire protection and police protection, schools, and other public services, but not to the extent that would require new or physically altered fire or police, schools, or other public facilities, the construction of which could result in significant environmental impacts. (*Less than Significant*)

Fire Protection and Emergency Medical Services

The San Francisco Fire Department (fire department) provides fire suppression services and unified emergency medical services and transport, including basic life support and advanced life support services, in the City. The fire

department's firefighting companies are organized into three divisions: the Airport Division, which serves San Francisco International Airport, and Divisions 2 and 3, which serve the rest of San Francisco.[124]

The project site is located in Division 3, which is divided into five battalions (Battalions 2, 3, 6, 9, and 10). The project site is within the service area of Battalion 2. Fire stations in Battalion 2 closest to the project site include Station 29 (299 Vermont Street), Station 7 (2300 Folsom Street), Station 36 (109 Oak Street), and Station 6 (135 Sanchez Street). Of these, Station 29 is the fire station closest to the project site, located approximately 0.30 mile northeast of the project site, and would likely be first on the scene of a fire.[125] Station 29 is equipped with an engine.[126] Station 7, located approximately 0.5 mile southwest of the project site, operates a ladder truck and would also serve the project site.[127,128]

The fire department responds to two types of calls. Code 2 calls are non-life-threatening fire and medical emergencies, and Code 3 calls are life-threatening fire and medical emergencies, the highest response priority. When responding to Code 3 calls, fire department vehicles use flashing lights and sirens and cross intersections against control lights. Responses to Code 2 calls are dispatched without lights and sirens. In San Francisco, response times are calculated from the time the dispatch is received and acknowledged at the station to the time the responding unit informs dispatch that it is at the scene.

According to policy set forth by San Francisco's Emergency Medical Services Agency, ambulances should arrive at the scene of a life-threatening emergency medical incident within 10 minutes of dispatch 90 percent of the time. The ambulance-on-time performance rate has steadily improved since the lowest rate of 76 percent in July 2014 and, as of Fiscal Year 2019-2020, now meets the 90 percent target.[129]

As discussed in Section E.3, Population and Housing, pp. 19-21, the proposed project or project variants would add approximately 1,357 new residents and 548 net new employees (from 400 to 948) to the project site. The increased population resulting from the proposed project or project variants would be expected to increase demand for fire protection and emergency medical services. However, this increase in demand would not be substantial given the overall demand for such services on a citywide basis. Furthermore, the fire department conducts ongoing assessments of its service capacity and response times to maintain acceptable service levels, given the demand resulting from changes in population.

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[124] San Francisco Fire Department, Find Your Station, *https://sf-fire.org/find-your-station,* and Fire Station Locations, *http://sf-fire.org/fire-station-locations,* accessed March 26, 2021.

[125] San Francisco Fire Department, *https://sf-fire.org/fire-station/san-francisco-fire-station-29,* accessed May 28, 2021.

[126] Fire Department.net, Fire Equipment at San Francisco Fire Department, *https://www.firedepartment.net/directory/california/san-francisco-county/san-francisco/san-francisco-fire-department/fire-equipment*, accessed March 26, 2021.

[127] San Francisco Fire Department, *https://sf-fire.org/fire-station/san-francisco-fire-station-7*, accessed March 26, 2021.

[128] Fire Department.net, Fire Equipment at San Francisco Fire Department, *https://www.firedepartment.net/directory/california/san-francisco-county/san-francisco/san-francisco-fire-department/fire-equipment*, accessed March 26, 2021.

[129] City and County of San Francisco, City Performance Scorecards, Ambulance Response to Life-Threatening Emergencies, *http://sfgov.org/scorecards/public-safety/ambulance-response-life-treatening-emergencies*, accessed March 26, 2021.

The proposed project or project variants would be required to comply with all applicable building and fire code requirements, which identify specific fire protection systems, including, but not limited to, the provision of state-mandated smoke alarms, fire alarm and sprinkler systems, fire extinguishers, required number and location of egress points with appropriate distance separation, and emergency response notification systems. The overall height of the structure would be approximately 150 feet and, for the purposes of fire protection, would be classified as a high-rise building. As such, the proposed project or project variants would comply with Section 907 of the San Francisco Fire Code, which requires a secondary water supply and fire pump capable of supplying the required fire flow for fire protection to be installed on site.

For these reasons, implementation of the proposed project or project variants would not require the construction of new, or alteration of existing, fire protection facilities. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Police Protection Services

The San Francisco Police Department (police department) provides police protection in the City. Police department services include responding to calls for police assistance, monitoring and managing traffic, and performing general surveillance duties. The department consists of the Golden Gate and Metro divisions and the Operations, Special Operations, and Administration bureaus. The Golden Gate and Metro divisions contain ten separate districts that cover the City. The project site is within the Mission Police District, and the closest police station is the Mission Street Station at 630 Valencia Street, approximately 0.7 mile west of the project site.[130]

The police department does not have an adopted standard for the ratio of officers to population or developed acreage and bases its staffing levels on the number of service calls and crime incidents. Total call volume, comprised of emergency and nonemergency calls, is growing. Between March 2019 and January 2020, the City received approximately 2,000 daily 911 calls, up from approximately 1,400 calls per day in 2008.[131]

Implementation of the proposed project or project variants would add approximately 1,357 new residents and 548 net new employees to the project site, which could increase the demand for police protection services. The Mission Police District serves a population of approximately 80,000 and handled 13.7 percent of all calls in the City from 2008 to 2013.[132] The increased demand generated by the proposed project or project variants would be small relative to the existing service population, would not impact a high-demand district, and could be accommodated by existing services.

The increased demand for police services related to the proposed project's or project variants' onsite population of residents, workers, and visitors would be incremental. The incremental increases in costs incurred by the police

[130] San Francisco Police Department, Station Finder Map, *https://www.sanfranciscopolice.org/your-sfpd/sfpd-stations/station-finder*, accessed March 26, 2021.

[131] San Francisco Police Department, 911 Call Volume and Response, *https://sfgov.org/scorecards/public-safety/911-call-volume-and-response*, accessed March 26, 2021.

[132] Public Safety Strategies Group LLC, District Station Boundary Analysis Report, 2015, p. 33.

department related to the proposed project or project variants would be funded largely through project-related increases to the City's tax base. The increased demand would not be considered substantial given the relatively low demand for such services at the district level and the ongoing staffing analysis and dynamic resource deployment that occurs on a citywide basis. In compliance with City charter mandate, police department resources are regularly redeployed based on need in order to maintain charter-mandated staffing and acceptable service ratios.

For these reasons, implementation of the proposed project or project variants would not require the construction of new, or alteration of existing, police facilities. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Schools

The San Francisco Unified School District (school district) operates San Francisco's public schools. There are both attendance area and citywide schools in the school district.[133] The project site is within the attendance area for the Moscone Elementary School, located at 2576 Harrison Street. Other nearby public schools are the Marshall Elementary School (1575 15th Street), John O'Connell High School (2355 Folsom Street), and Downtown High School (693 Vermont Street). Starting at the elementary school level, students can choose between the two categories and list their preferred choices on the application. There are several tiebreakers used to help place students in a requested school when the number of requests for a school exceeds spaces available. At the elementary school level, these tiebreakers include older siblings already attending the preferred school, whether the student attended a school district's pre-kindergarten, the test score area in which the student resides, and the attendance area in which the student resides.

The school district maintains a property and building portfolio that has a student capacity for over 63,400 students.[134,135] Between 2000 and 2010, overall enrollment in the school district experienced a decline but the district has experienced a gradual increase in enrollment during the past decade. Total enrollment in the district increased to about 52,763 in the 2017–2018 school year.[136] In addition, for the 2018–2019 school year, approximately 4,502 students enrolled in public charter schools that are operated by other organizations but located in school

[133] San Francisco Unified School District, 2019-2020 School Year Location Map, *https://archive.sfusd.edu/en/assets/sfusd-staff/enroll/files/2019-20/2019-20_schools_map.pdf*, accessed March 26, 2021.

[134] This analysis was informed, in part, by a Target Enrollment Survey the San Francisco Unified School District performed of all schools in 2010.

[135] San Francisco Unified School District, *San Francisco Bay Area Planning and Urban Research (SPUR) Forum Presentation, Growing Population, Growing Schools*, August 31, 2016, *https://www.spur.org/sites/default/files/events_pdfs/SPUR%20Forum_August%2031%202016.pptx_.pdf*, accessed May 26, 2021.

[136] Lapkoff & Gobalet Demographic Research, Inc., Demographic Analyses and Enrollment Forecasts for the San Francisco Unified School District, January 2020.

district facilities.[137] Thus, even with increasing enrollment, school district facilities throughout the City are underutilized and the district has more classrooms district-wide than needed.[138]

The school district has engaged a demographic consultant to assist in preparation of demographic analyses and enrollment projections (the study), which are being updated over time as additional data are available. The most recent analysis projects the enrollment contribution through 2040 from several new and ongoing large-scale developments (Mission Bay, Candlestick Point, Hunters Point Shipyard/San Francisco Shipyard, and Treasure/Yerba Buena Islands, Parkmerced, and others) as well as planned housing units outside those areas. The study developed public school student yield assumptions informed by historical yield, building type, unit size, unit price, ownership (rented or owner-occupied), whether units are subsidized, whether subsidized units are in stand-alone buildings or in inclusionary buildings, and other site-specific factors. For most developments constructed since 2010, the study found that outside of public housing, new stand-alone family and affordable housing units have the highest student yields – 0.48 students per unit. The study found that student yields for other housing types constructed since 2010 include approximately 0.22 students per unit for inclusionary affordable housing units and 0.01 students per unit for market-rate housing.[139] Implementation of the proposed project or project variants would result in the construction of up to 575 residential units and an anticipated 1,375 residents. Some of the new residents would consist of families with school-aged children who might attend school district schools, while others might attend private schools. Assuming the residential uses under the proposed project or project variants would be 100 percent affordable, the anticipated number of public school children as a result of the project would be within 127 to 276 public school students.

The proposed project or project variants would generate a direct incremental increase in the demand for school services. As stated above, the school district has adequate capacity for the new students generated by the proposed project or project variants. Furthermore, the proposed project would be required to pay a school impact fee based on the construction of net new residential square footage to fund school district facilities and operations.

For these reasons, implementation of the proposed project or project variants would not result in a substantial unmet demand for school facilities and would not require new school construction or alteration of existing school facilities. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

[137] Lapkoff & Gobalet Demographic Research, Inc., Demographic Analyses and Enrollment Forecasts for the San Francisco Unified School District, January 2020.

[138] San Francisco Unified School District, *San Francisco Bay Area Planning and Urban Research (SPUR) Forum Presentation, Growing Population, Growing Schools*, August 31, 2016, *https://www.spur.org/sites/default/files/events_pdfs/SPUR%20Forum_August%2031%202016.pptx_.pdf*, accessed May 26, 2021.

[139] Lapkoff & Gobalet Demographic Research, Inc., Demographic Analyses and Enrollment Forecasts for the San Francisco Unified School District, January 2020.

Libraries

Library services are provided by the San Francisco Public Library, which operates a main branch at 100 Larkin Street and 27 other neighborhood branches throughout San Francisco. Library branches nearest the project site are the Mission Library (1 mile southwest), Potrero Hill (0.6 mile southeast), and the main branch (1 mile north).[140]

Implementation of the proposed project or project variants would add about 1,357 new residents and 548 net new employees (from 400 to 948) to the project site and would result in an increase in demand for library services. It is anticipated that the nearby libraries would be able to accommodate the minor increase in demand for library services generated by the new residents and employees. Thus, project-generated demand would not be substantial given the overall demand for library services on a citywide basis.

For these reasons, implementation of the proposed project or project variants would not require the construction of new, or alteration of existing, library facilities. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-PS-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative impacts on public services. (*Less than Significant*)

Cumulative projects in the vicinity would result in an intensification of land uses and a cumulative increase in the demand for fire protection, police protection, school services, and other public services. The fire and police departments, libraries, and other City agencies respond to growth and other changing service needs through ongoing analysis of applicable metrics, such as staffing, capacity, response times, and call volumes. As a result, projected future development would not result in any service gap in citywide police, fire, and emergency medical services. Because there is no shortfall with respect to library services, there would not be any service gaps in citywide library services.

With respect to public schools, the school district currently has capacity for additional students anticipated through 2030. The school district works with the planning department and other City agencies to develop public school student enrollment projections and inform its facility planning. As the school district's teaching methods and best practice space utilization for learning evolve, historical capacities will need to be updated to reflect new standards. The school district is currently assessing how best to incorporate the education field's best practices in terms of space utilization for 21st-century education. This assessment will inform how to accommodate anticipated future school population and whether new or different types of facilities are needed. Should additional capacity be required to meet the updated educational space standards and projected public school student population, the school district is considering several options. A new school anticipated to have capacity for 500 students is under development in Mission Bay at the corner of Owens Street and Nelson Rising Lane. In addition, in the near term,

[140] San Francisco Public Library, Library Locations, *https://sfpl.org/locations/*, accessed March 26, 2021.

there is an existing school site on Treasure Island that will be leased by the school district.[141] There is also a project planned for the replacement, renovation, and expansion of the district's 135 Van Ness Avenue property for the Arts Center Campus. The school district could also renovate and reconfigure other existing school facilities and assets owned by the school district but not currently in school use, as necessary. However, it is too speculative to conduct a meaningful environmental review or identify significant cumulative impacts at this time without more information regarding what action or actions the school district would take to accommodate the additional students. The school district may choose to accommodate the additional students in a manner that would result in physical changes to the environment, but it is not possible to identify exactly where those actions would occur.

The school district has identified options for accommodating the anticipated future public student population, as described above. The proposed project or project variants would result in an incremental increase of between 127 and 276 public school children in a transit- and amenity-rich area that is targeted for future housing production. Moreover, the numerous sources of uncertainty discussed above create challenges for accurately determining future student enrollment projections, particularly beyond 2030, as well as the location and capacity of facilities, if any, that may be constructed, reconfigured, or expanded. As a result, any determination of a significant cumulative effect related to provision of public school facilities would be speculative. Therefore, the proposed project or project variants would not be expected to result in a significant contribution to a cumulative public services impact related to schools.

For these reasons, the proposed project or project variants would not combine with cumulative projects in the vicinity to create a significant cumulative impact on public services. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

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[141] Renovation and expansion of that school site was studied in the Treasure Island / Yerba Buena Island Redevelopment Project Draft EIR. For more information, please see *Treasure Island / Yerba Buena Island Redevelopment Project Draft EIR*, Planning Case No. 2007.0903E.

E.15 Biological Resources

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
15. BIOLOGICAL RESOURCES. Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐	☐
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☐	☒

Summary of Biological Resources Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. Comments on the NOP received during the NOP scoping period and related to biological resources expressed concern with the project glazing and bird strikes, the effects of construction and outdoor lighting on birds, and the need for nesting bird surveys (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

The project site is occupied by an asphalt surface parking lot and a building and is completely covered by impervious surfaces. The project site does not contain federally protected wetlands as defined by section 404 of the Clean Water Act, riparian habitat, or other sensitive natural communities. The nearest mapped water bodies are 0.7 mile northwest (China

Basin Water Channel) and 1.2 miles west (San Francisco Bay).[142] Implementation of the proposed project or project variants therefore would not adversely affect federally protected wetlands, riparian habitat, or sensitive natural communities protected by federal or state laws or regulations. In addition, the project site is not located within an adopted habitat conservation plan, a natural community conservation plan, or other approved local, regional, or state habitat conservation plan areas. Thus, initial study checklist topics E.15(b), E.15(c), and E.15(f) are not applicable to the proposed project or project variants and will not be analyzed further in this initial study and the EIR.

As stated in Section D, Summary of Environmental Effects, p. 11, and EIR Chapter 2, Project Description, pp. 2.49-2.54, the proposed project or project variants would be subject to public works' SCMs. SCM #7, Biological Resources, and SCM #8, Visual and Aesthetic Considerations, Project Site, establish procedures for compliance with federal and state requirements and for implementation of best site management practices as they relate to bird protection, tree conservation, environmentally sensitive areas, and construction staging. Through implementation of applicable measures, significant impacts to biological resources would be avoided (see EIR Appendix C).

Impact BI-1: The proposed project or project variants would not have a substantial adverse effect, either directly or indirectly through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service; and the proposed project or project variants would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (*Less than Significant*)

The project site is covered entirely by impervious surfaces. It has no intermittent or permanent streams and no connectivity to wildlife habitats. While there is no vegetation onsite, there are 27 street trees on sidewalks adjacent to the project site: nine on 17th Street, seven on Hampshire Street, and 11 on Bryant Street. (See EIR Figure 2.2, p. 2.5.) Franklin Square, across 17th Street to the north, is an approximately 4.4-acre landscaped public park with a centrally located soccer field and mature trees and landscaping along 17th, Bryant, and 16th streets. The surrounding area is developed with buildings and roadways, including the Safeway Potrero Center at 16th and Bryant streets. Because the project site is located within a built urban environment, it is subject to routine disturbances, including pedestrian and vehicular activity as well as activity at the transit facility, which serves up to 158 trolley buses and 56 non-revenue vehicles.

The project site does not serve as a nursery site or corridor for native resident or migratory fish or wildlife. As further detailed under Impact BI-2 and as described in EIR Chapter 2, Project Description, p. 2.47, the proposed project or project variants would retain some mature street trees along Bryant, 17th, and Hampshire streets, to the maximum extent feasible; replace those that have to be removed; and plant new street trees such that all adjacent sidewalks would have trees once landscaping is completed. The proposed project or project variants would also develop a 5-foot-wide landscaping zone along the approximately 480-foot-long 17th Street frontage.

[142] United States Fish and Wildlife Service (USFWS), National Wetlands Inventory, October 8, 2019, *https://www.fws.gov/wetlands/data/Mapper.html*, accessed March 26, 2021.

Due to the developed nature of the project site and the surrounding area, the project site does not provide suitable habitat for any candidate, sensitive, or special-status plant or wildlife species. The existing trees adjacent to the project site could support habitat for migratory nesting birds protected under the California Fish and Game Code or the Migratory Bird Treaty Act, as discussed below.

Resident and Migratory Birds-

The street trees on the adjacent sidewalks on 17th, Hampshire, and Bryant streets, as well as street trees and landscaped areas in the project vicinity including Franklin Square across 17th Street to the north, may provide suitable habitat for resident and migratory birds covered under the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–711) and the California Fish and Game Code (sections 3503 and 3503.5).

Nesting birds may be present in the existing street trees surrounding the project site. The proposed project or project variants would result in the loss of nesting habitat because some street trees along adjacent sidewalks would be removed. Additionally, the proposed project or project variants could result in the loss of nesting habitat in the street trees or landscaped areas in the project vicinity due to construction disturbance. Any loss of nesting habitat would be temporary, and after the proposed project's or project variants' approximately three- to four-year construction period, including any required street tree planting and landscaping improvements, birds would be expected to return.

The SFMTA and private project co-sponsor would be required to comply with California Fish and Game Code section 3500 et seq., which provide that it is unlawful to take or possess any migratory nongame bird or needlessly destroy nests of birds except as otherwise outlined in the code. The California Department of Fish and Wildlife enforces the code by requiring that projects incorporate measures to avoid and minimize impacts to nesting birds if any tree removal would occur during the nesting or breeding season. Tree removal and construction-related activities associated with the proposed project or project variants could adversely affect bird breeding and nest behaviors adjacent to the project site and in the immediate vicinity. Construction activities that may cause visual disturbance or alter the ambient noise environment include demolition of the existing maintenance and operations building and bus storage yard and appurtenances and construction of the foundation for the new building, e.g., pile driving. Although adult birds can escape the project site to avoid direct harm during construction, eggs or chicks associated with active nests could still be permanently affected (i.e., abandoned or killed) by project construction activities.

Due to the removal of some street trees and construction activities, the proposed project or project variants may result in the displacement of nesting migratory birds and/or the abandonment of active nests if construction and street tree removal occur during the typical nesting season (January 15 through August 15).

SFMTA through public works would continue to provide oversight for construction of the proposed project or project variants, which would be subject to public works' SCMs (see EIR Appendix C). SCM #7, Biological Resources, specifies that projects will comply with all local, state, and federal requirements for surveys, analysis, and protection of biological resources (e.g., Migratory Bird Treaty Act, Federal and State Endangered Species Acts, etc.). The project site and the immediately surrounding area will be screened to determine whether biological resources may be

affected by construction. If biological resources are present, a qualified biologist will carry out a survey of the project site to note the presence of general biological resources and to identify whether habitat for special-status species and/or migratory birds is present. If necessary, measures will be implemented to protect biological resources, such as installing wildlife exclusion fencing, establishing work buffer zones, installing bird deterrents, having a qualified biologist conduct monitoring, and other applicable measures. Tree removal will also comply with any applicable tree protection ordinance. Additionally, SCM #8, Visual and Aesthetic Considerations, Project Site, requires all project sites to be maintained in a clean and orderly state during construction and returned to their general pre-project condition (including re-grading and re-vegetation of disturbed areas) after project completion.

Accordingly, the proposed project or project variants would be subject to public works' SCM #7, Biological Resources, to avoid potential significant impacts on biological resources. SCM #7, Biological Resources, would therefore be incorporated into the proposed project or project variants. Thus, construction activities for the proposed project or project variants would avoid impacts on nesting birds covered under the Migratory Bird Treaty Act and California Fish and Game Code by ensuring project activities do not result in the take of an active nest. This impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Bird-Safe Buildings

Structures in an urban setting may present risks for birds traversing their migratory paths due to building location and/or building features. The proposed project or project variants would construct a new building with a larger footprint and substantially increased height compared to the existing predominantly single-story maintenance and operations building on the eastern portion of the project site (i.e., from approximately 45 feet at the existing building's southeast corner with the office and shops wings to heights ranging from 75 to 150 feet across the site). This could create potential obstacles for resident or migratory birds and could result in an increase in bird injury or mortality in the event of a collision. The City has adopted guidelines to address this issue and provided regulations for bird-safe design within the City, including building design standards to reduce avian mortality rates associated with bird strikes.[143]

The building standards are based on two types of hazards: 1) location-related hazards which pertain to new buildings within 300 feet of an Urban Bird Refuge, and 2) feature-related hazards such as free-standing glass walls, wind barriers, skywalks, balconies, and greenhouses on rooftops that have unbroken glazed segments 24 square feet or larger in size. The project site is not located within 300 feet of an Urban Bird Refuge; therefore, the standards for location-related hazards would not apply.[144] The proposed project or project variants would be required to comply with the building feature-related hazard standards.

[143] San Francisco Planning Department, Standards for Bird-Safe Buildings, *https://sfplanning.org/sites/default/files/documents/reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf*, accessed March 26, 2021.

[144] San Francisco Planning Department, Urban Bird Refuge Map, 2014, *https://sfplanning.org/resource/urban-bird-refuge*, accessed March 26, 2021.

Planning code section 139 addresses feature-related bird hazards for new building construction and replacement façades. The existing maintenance and operations building would be demolished, and a new building would be constructed at the project site ranging from 75 to 150 feet in height. The proposed project or project variants would comply with the feature-related standards of planning code section 139 by using bird-safe glazing treatment on 100 percent of any feature-related hazards (e.g., balconies, wind barriers, or free-standing glass walls).

With planning code section 139 compliance and implementation of public works' SCM #7, Biological Resources, the proposed project or project variants would not interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors. Therefore, this impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Impact BI-2: The proposed project or project variants would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (*Less than Significant*)

Trees in the City and County of San Francisco are protected under public works code article 16 section 801 et seq. (the Urban Forestry Ordinance). The Urban Forestry Ordinance provides for the protection of landmark trees, significant trees, and street trees located on private or public property anywhere within the territorial limits of the City and County of San Francisco.[145]

Landmark trees are designated by the board of supervisors upon the recommendation of the Urban Forestry Council, which uses established criteria (public works code section 810) to determine whether a nominated tree meets the qualifications for designation. Significant trees are those trees within the jurisdiction of public works or trees on private property within 10 feet of the public right-of-way that meet any of three size criteria: they must have a diameter at breast height in excess of 12 inches, or a height in excess of 20 feet, or a canopy in excess of 15 feet (public works code section 810(A)(a)). Street trees are any tree growing within the public right-of-way, including unimproved public streets and sidewalks, and any tree growing on land under the jurisdiction of public works (public works code section 802(w)).

There are no trees on the project site. Therefore, there are no landmark trees or significant trees on the project site. There are 27 street trees on sidewalks adjacent to the project site: nine on 17th Street, seven on Hampshire Street, and 11 on Bryant Street. There are no street trees along the Mariposa Street frontage. As feasible, the SFMTA and the private project co-sponsor would retain existing street trees or plant new street trees on the adjacent sidewalks, including replacement of any removed street trees, to comply with the requirements of one street tree per 20 feet of street frontage.[146] Specific streetscape changes related to the retention and planting of existing and new street trees would include the following:

- On 17th Street, the existing mature trees would be retained, except for any that would conflict with the proposed location for the emergency bus exit, and new street trees would be planted.

[145] San Francisco Public Works Code, Article 16: Urban Forestry Ordinance, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-4066*, accessed March 26, 2021.

[146] San Francisco planning code section 138.1(c)(1) and public works code sections 805(a) and 806(d).

- On Bryant and Hampshire streets, trees located in the middle of the sidewalk may be replaced, and new street trees would be planted.
- On Mariposa Street, approximately six trees would be added in locations that would not conflict with the proposed trolley bus driveways.

All new and/or replacement trees would be planted in accordance with the standards in the Better Streets Plan. If site constraints (such as conflicts with driveways, trolley bus turn movements, or existing street furniture) make this infeasible, a waiver of this requirement may be requested from the Zoning Administrator, in which case the in-lieu street tree fee would be required.[147,148] The City's Urban Forestry Ordinance requires a permit from public works to remove any protected trees, and the ordinance states that public works shall require that replacement trees be planted (at a one-to-one ratio) by a project sponsor or that an in-lieu fee be paid by a project sponsor (public works code section 806(b)).[149] Additionally, in compliance with the Urban Forestry Ordinance, a project sponsor would be required to obtain a specific Tree Protection Plan prepared by an International Society of Arboriculture-certified arborist to protect the adjacent street trees during construction. Further, SCM #7, Biological Resources, incorporated as part of the proposed project or project variants, would ensure compliance with the substantive requirements of public works code article 16 for all work around significant trees. Compliance would include the determination of whether trees proposed for removal, if any, meet the criteria for significant trees, and, if so, requires implementation of the procedures for working within the dripline of or removal of significant trees described in public works code article 16. Compliance with the substantive requirements of the public works code for all work in the vicinity of significant trees would avoid any conflicts with local plans or policies protecting trees.

Therefore, the proposed project or project variants would not conflict with the City's local tree ordinance, and this impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-BI-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative impacts on biological resources. (*Less than Significant*)

The geographic scope of potential cumulative biological resources impacts to which the proposed project or project variants could contribute encompasses a 0.25-mile area around the project site. (See EIR Table 3.A.1 and EIR Figure 3.A.1, pp. 3.A.7-3.A.9, for a list and map of the cumulative projects.) As described above, the project site is completely covered by a building and an impervious asphalt-paved parking lot. There are no federally protected wetlands, riparian habitat, or other sensitive natural communities on the site, and the site is not located within an adopted habitat conservation plan, a natural community conservation plan, or other approved local, regional, or state habitat conservation plan areas. Thus, potential cumulative impacts on biological resources are limited to the removal of protected trees, modification or interference with existing habitats, wildlife nursery sites, or migratory wildlife corridors.

[147] San Francisco planning code section 138.1(c)(1)(C)(iii).
[148] San Francisco planning code section 428.
[149] San Francisco Public Works Code, Article 16: Urban Forestry Ordinance, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-4066*, accessed March 26, 2021.

Construction of the cumulative projects in the vicinity would consist of infill development in an urban setting on previously disturbed sites and work in the public right-of-way (16th Street transit service enhancements and Northwest Mission Parking Management Plan); limited removal of trees and vegetation would be expected to occur. The removal of vegetation and trees during nesting seasons could result in a significant cumulative impact on nesting birds. However, cumulative projects such as 1850 Bryant Street and 321 Florida Street would also be subject to planning code section 138.1(c)(1) and public works code sections 805(a) and 806(d). The cumulative projects would also be required to comply with the requirements of the Urban Forestry Ordinance, California Department of Fish and Wildlife, and Migratory Bird Treaty Act related to nesting birds, including measures similar to those identified for the proposed project or project variants.

As noted above under Impacts BI-1 and BI-2, with the exception of the 5-foot-wide landscaping zone along the 17th Street frontage associated with the proposed project or project variants and aforementioned street tree improvements, the site and cumulative projects would not provide habitat supportive of sensitive wildlife and plants. Therefore, the proposed project or project variants would have limited potential to affect sensitive plants or wildlife with adherence to street tree protection requirements, bird-safe building requirements, and nesting bird protections requirements of the planning code, the public works code, and public works' SCM #7, Biological Resources.

Therefore, the cumulative projects would not combine with the proposed project or project variants to create a significant cumulative impact on biological resources. Mitigation measures are not required. This topic will not be discussed in the EIR.

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E.16 Geology and Soils

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
16. GEOLOGY AND SOILS. Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	☐	☐	☒	☐	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	☐
iv) Landslides?	☐	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐	☐

Summary of Geology and Soils Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to geology and soils (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Existing Setting

The information in this section describes the geology, soils, and seismicity characteristics of the project site and immediate vicinity and relies on the information and findings in the November 2019 Geotechnical Engineering Report[150] prepared by the joint venture of Arup/RYCG, unless otherwise noted.

The scope of the geotechnical report included reviewing, exploring, and analyzing the subsurface conditions regarding soil and groundwater at the project site. It included a site visit; limited field investigations, which included six soil borings to a maximum depth of 121 feet, a review of available geologic and geotechnical data for the site vicinity from previous geotechnical studies, an engineering analysis of the proposed project in the context of geologic and geotechnical site conditions, and project-specific design and construction recommendations which include, but are not limited to, options for foundation systems.

The project site is located within the Coast Ranges geomorphic province within the Fort Point-Hunter Point shear zone. The site is located at the northwestern extent of the Potrero Hill bedrock outcrop, which is characterized by serpentinite and sheared shale matrix mélange of the Franciscan complex. The Franciscan rock is highly deformed and fractured and is composed of shear zones trending in a northwest-southwest configuration.

The project site is underlain by sandy clay, clayey sand, and sand associated with the Colma and Franciscan formations, as well as weathered bedrock associated with the Franciscan Complex. As described in the geotechnical report, six boreholes were drilled at the project site in March 2018. The borehole samples were laboratory tested for soil index properties and strength and were also used to inform a model of the site's subsurface stratigraphy. The soil profile varies significantly throughout the project site but contains similar soil units of varying thickness.

In the northeast corner of the site, the existing maintenance and operations building is founded directly on bedrock in the Franciscan Formation, consisting of weathered shale and serpentinite rock. The serpentinite and shale rock encountered in boreholes on the site were typically highly to completely weathered, extremely to very weak, and very soft to soft. Based on the findings for Borehole 2, the weathered bedrock dips steeply towards the southwest corner of the site (Mariposa and Bryant streets) where it is approximately 69 feet below ground surface. Borehole 2 extended to 121 feet below ground surface and encountered 52 feet of weathered bedrock before the borehole was terminated. Where the weathered bedrock is not present at or close to the ground surface, it is generally overlain by varying thicknesses of dense to very dense sand which is in turn overlain by loose to very dense clayey sand.

In the northwest corner of the site a layer of stiff to very stiff sandy clay is locally present above the clayey sand layer. Fill of varying thicknesses exists across the entire site. Outside the footprint of the existing maintenance and operations building, the site is covered by pavement consisting of asphalt over concrete approximately 10 to 12 inches thick. Below this, the fill generally comprises silty sand and silty gravel between approximately 1 to 6 feet thick. Borehole 5, located within the maintenance and operations building, encountered a 7-inch-thick concrete slab overlying approximately 4 feet of artificial sand fill. In the northwest corner of the site, a localized layer of stiff to very stiff sandy clay was encountered

[150] ARUP/RYCG, SFMTA Potrero Yard Facility Rebuild Geotechnical Engineering Report, November 11, 2019.

beneath the fill to a depth of about 5 to 8 feet below ground surface. Loose to very dense clayey sand ranging from approximately 8 to 21 feet in thickness was present in all boreholes on the site except those in the northeast corner where weathered bedrock is near the ground surface. Poorly graded dense to very dense sand, sometimes with some silt or clay content, was found to be present in thicknesses between 5 and 47 feet above the top of the weathered bedrock. Based on evidence from two boreholes, perched groundwater was encountered at a depth of approximately 9 feet, with groundwater encountered at a depth between 30 and 35 feet below the existing ground surface. Groundwater levels are likely to experience seasonal fluctuations, as the volume of seepage occurring through the weathered rock mass varies. However, the design groundwater elevation for purposes of determining the foundation capacity is defined as 33 feet below ground surface. Further, to account for fluctuations in groundwater to conservatively assess liquefaction potential, a groundwater elevation of 20 feet below ground surface was assumed.

Regulatory Setting

Existing laws and regulations that stipulate a regulatory process to address seismic and geologic hazards to achieve minimum levels of safety in the construction of new structures are described below.

Federal and State Regulations

The Earthquake Hazard Reduction Act of 1977[151] was enacted to reduce risks to life and property from earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program. Implementation of these requirements is regulated, monitored, and enforced at the state and local levels. In particular, the Alquist-Priolo Act regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. The State Geologist maps active faults and designates Earthquake Fault Zones along mapped faults. In addition, pursuant to the Seismic Hazard Mapping Act of 1990[152], the State Geologist has delineated Seismic Hazard Zones for landslide and liquefaction hazards. City, county, and state agencies are directed to use seismic hazard zone maps in their land use planning and permitting processes. In accordance with the Seismic Hazards Mapping Act, site-specific geotechnical reports must be performed prior to permitting most urban development projects within seismic hazard zones. Through the requirements of the act, the loss of life and property is minimized by identifying and mitigating seismic hazards, such as those associated with strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes.

California Building Standards Code and San Francisco Building Code

The state building code generally applies to all occupancies in California, with modifications adopted in some instances by state agencies or local governing bodies. Relevant sections of the California Building Standards Code are provided below under Impact GE-1 on p. 101. The San Francisco Building Code (building code) adopts the state code with some amendments. In addition, administrative bulletins have been adopted as part of the building code, and the department of building inspection issues information sheets that form implementing procedures in their role of enforcing the building codes.

[151] United States Code Title 42, Chapter 86.
[152] Public Resources Code Chapter 7.8, Division 2.

CEQA Section 5097.5

Requirements for paleontological resource management are included in Public Resources Code, Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244, which states:

> "No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor."

Project-Specific Impacts

The project site is not located within a mapped seismic hazard zone for earthquake-induced landslides.[153,154] The approximate elevation on the northeast corner of the site (17th and Hampshire streets) is 75 feet SFVD13.[155] The approximate elevation on the southwest corner of the site (Bryant and Mariposa streets) is 48 feet SFVD13. The project site slopes up toward the north and east (17th and Hampshire streets) and slopes downhill toward the south and west (Mariposa and Bryant streets) with minimal slope gradient. The northeast-to-southwest slope is approximately 4.3 percent. The north-to-south slope is approximately 5.5 percent along Hampshire Street and 3.5 percent along Bryant Street. The east-to-west slope along 17th Street is approximately 3 percent and along Mariposa Street it is relatively flat or at grade with a slope of 1 percent. Thus, the proposed project or project variants would have limited to no potential to exacerbate the potential for earthquake-induced landslides. As such, initial study checklist topic E.16(a)(IV) is not applicable to the proposed project or project variants and is not discussed below. The new building associated with the proposed project or project variants would connect to the existing combined sewer system and would not use septic tanks or alternative wastewater disposal systems (see initial study Section E.13, Utilities and Service Systems). Therefore, initial study checklist topic E.16(e) is not applicable.

As described in EIR Chapter 2, Project Description, p. 2.55, site features would be removed, including the retaining walls along the north, east, and west sides of the site, and excavation would extend up to 35 feet below grade level. The proposed foundation system for the 150-foot-tall structure would consist of a shallow foundation of spread footings at column locations or a structural mat slab bearing on bedrock along the northeast portion of the site (where bedrock is near the surface) with a deeper foundation bearing on pile groups of between 4 to 12 piles per

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153 City and County of San Francisco, Community Safety Element of the San Francisco General Plan (hereinafter referred to as "Community Safety Element"), Map 4 (Seismic Hazard Zones San Francisco, 2012), *https://generalplan.sfplanning.org/Community_Safety_Element_2012.pdf*, accessed March 26, 2021.

154 State of California, Seismic Hazard Zones, City and County of San Francisco, Official Map, November 17, 2000, *https://sfgov.org/esip/sites/default/files/FileCenter/Documents/10438-California%20Seismic%20Hazard%20Zones%20Map.pdf*, accessed March 26, 2021.

155 SFVD13 is the new San Francisco Vertical Datum. Vertical Datum is a measure of vertical height of the ground above a specified zero point and is used to describe the topography of a site. Old San Francisco Datum, in use until about 2014, was based on the National Geodetic Vertical Datum of 1929 (NGVD29). NGVD29 uses mean sea level as the zero point; the zero point for the old SF Datum was approximately 8.6 feet above mean sea level. The City began revising its database in 2013 and completed the new vertical datum in 2014. SFVD13 is based on the North American Vertical Datum of 1988 (NAVD88) and was established using more precise measurements than the Old San Francisco Datum.

column to support development in other areas of the site.[156] The deep foundation system would be supported by driven steel piles; however, non-displacement auger cast in place piles are also identified as an option in the geotechnical report.

The proposed project and its variants would use similar demolition, excavation, and construction techniques with no change to the depth of excavation or intensity of earthwork activity based on variant chosen. Thus, this analysis is applicable to both the proposed project and its variants.

As stated in Section D, Summary of Environmental Effects, p. 11, and EIR Chapter 2, Project Description, pp. 2.49-2.54, the proposed project or project variants would be subject to public works' SCMs. SCM #1, Seismic Studies, requires project sponsors to complete and submit geotechnical engineering reports for projects that involve excavation and building construction. Additionally, SCM #3, Water Quality, requires a project sponsor to implement erosion and sedimentation controls to prevent discharges of sediment and other pollutants to storm drains and a stormwater control plan or a stormwater pollution prevention plan, as applicable. Furthermore, SCM #3 requires that if uncontaminated groundwater is encountered during excavation activities, it will be discharged in compliance with applicable water quality standards and discharge permit requirements (see public works' SCM #6, Hazardous Materials, for groundwater contamination). Through implementation of applicable measures, significant seismic-related and groundwater-related impacts would be avoided (see EIR Appendix C).

Impact GE-1: The proposed project or project variants would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, and seismic-related ground failure including liquefaction. (*Less than Significant*)

Fault Rupture

Faults are weak areas in the earth's crust where tectonic plates slide past each other. Earthquakes occur when movement occurs along the faults and they rupture or slip. The California Geologic Survey publishes maps of the Alquist-Priolo earthquake fault zones, which are regulatory zones around the surface of active faults. The project site does not fall within an Alquist-Priolo fault zone and no active faults are recorded within the project site.[157,158] Therefore, the proposed project or project variants would not exacerbate the potential for surface rupture, and impacts related to surface rupture would not occur. Mitigation measures are not required. This topic will not be discussed in the EIR.

Ground Shaking

The Working Group for California Earthquake Probabilities estimates a 95 percent chance of having one or more magnitude 6.7 or larger earthquakes in the San Francisco Bay Area over the next 30 years (range 2014 – 2043). The closest major active faults include the San Andreas fault (approximately 7.3 miles southwest), San Gregoria fault

[156] Geotechnical Report, p. 27-39.
[157] Geotechnical Report, p. 9.
[158] Community Safety Element, Map 1 (Bay Area Earthquake Faults, 2007), *https://generalplan.sfplanning.org/Community_Safety_Element_2012.pdf*, accessed March 26, 2021.

(approximately 10.3 miles southwest), and the Hayward fault (approximately 11.3 miles northeast).[159] These faults have a 22 percent chance, a 6 percent chance, and a 33 percent chance of experiencing a magnitude 6.7 or greater earthquake over the next 30 years, respectively.[160] During a major earthquake, very strong ground shaking is expected to occur at the project site and its vicinity.[161] A magnitude 6.0 earthquake is felt by everyone, indoors and outdoors, and poorly built buildings may be damaged. A magnitude 7.0 earthquake causes damage and severe damage or the partial or complete collapse of poorly built structures and is felt across great distances (a 7.0 earthquake is approximately 1/16th as strong at a distance of 50 miles).[162,163] However, damage is generally negligible in buildings of good design and construction, while considerable damage may occur in poorly built buildings and structures.[164]

Although the potential for very strong seismic ground shaking is present, the intensity of earthquake ground motion on the project site and in the vicinity of the site would depend on the characteristics of the generating fault, the distance to the earthquake's epicenter, the magnitude and duration of the earthquake, and site geologic conditions. In the event of an earthquake that exhibits very strong seismic ground shaking, considerable damage could occur to the new building, potentially injuring building occupants and neighbors.

The proposed structure would be designed in accordance with the recommendations of the seismic design standards provided in the site-specific design-level geotechnical report prior to construction and the building would be constructed in conformance with accepted building and engineering standards in the building codes. The submittal documents for a building permit include plans, specifications, engineering calculations, diagrams, soil investigation reports, special inspection and structural observation programs and other data. The building permit application, including detailed addenda submittals to the site permit,[165] or equivalent permit for the proposed project or project variants would be reviewed by the department of building inspection for conformance with recommendations in the site-specific design-level geotechnical report, ensuring that potential effects from seismically induced ground shaking would be addressed in the building design process.

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159 Geotechnical Report, p. 9.

160 U.S. Geological Survey, Earthquake Outlook for the San Francisco Bay Region 2014-2043, *https://pubs.usgs.gov/fs/2016/3020/fs20163020.pdf*, accessed March 26, 2021.

161 Association of Bay Area Governments, San Francisco County Earthquake Hazard, *http://resilience.abag.ca.gov/earthquakes/sanfrancisco/*, accessed March 26, 2021.

162 U.S. Geological Society, Magnitude/Intensity Comparison, *https://www.usgs.gov/faqs/what-difference-between-earthquake-magnitude-and-earthquake-intensity-what-modified-mercalli?qt-news_science_products=0#qt-news_science_products*, accessed March 26, 2021.

163 University of Portland, Building and Earthquakes – Which stands? Which falls?, *https://www.iris.edu/hq/files/programs/education_and_outreach/retm/tm_100112_haiti/BuildingsInEQs_2.pdf,* accessed March 26, 2021.

164 U.S. Geological Survey, the Modified Mercalli Intensity Scale, *https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects*, accessed March 26, 2021.

165 San Francisco Building Code, Sections 106A.3.1, 106A.3.2, and 106A.3.4.2, and 106A.4.1.4, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_building/0-0-0-92027*, accessed May 28, 2021. Actual construction authorization of specific elements of a project are addressed through more detailed addenda submittals to the site permit, and these more detailed drawings are checked for code compliance before issuance.

The department of building inspection would also review the proposed building permit applications for compliance with the applicable provisions of the building code and state building code. The building codes provide minimum standards for use in building design to maintain public safety in the case of extreme ground shaking likely to occur during an earthquake. The purpose of the earthquake provisions within the building codes is primarily to safeguard against major structural failures and loss of life and to provide for the continuation of essential public services.

The state building code generally applies to all occupancies in California, with modifications adopted in some instances by state agencies or local governing bodies. The current state building code incorporates, by adoption, the 2019 edition of the International Building Code of the International Code Council with the California amendments. In particular, state building code Chapter 18, Soils and Foundations, provides the parameters for geotechnical investigations and structural considerations in the selection, design, and installation of foundation systems to support the loads from the structure above. Relevant sections include the following:

- Section 1803 sets forth the basis and scope of geotechnical reports conducted.
- Section 1804 specifies considerations for excavation, grading, and fill to protect adjacent structures and prevent destabilization of slopes due to erosion and/or drainage.
- Section 1804.1, Excavation Near Foundations, requires that adjacent foundations be protected against a reduction in lateral support as a result of project excavation. This is typically accomplished by underpinning or protecting said adjacent foundations from detrimental lateral or vertical movement, or both.
- Section 1807 specifies requirements for foundation walls, retaining walls, and embedded posts and poles for stability against overturning, sliding, and excessive pressure, and water lift including seismic considerations.
- Sections 1808 (foundations), 1809 (shallow foundations), and 1810 (deep foundations) specify requirements for foundation systems such that the allowable bearing capacity of the soil is not exceeded, and differential settlement is minimized based on the most unfavorable loads specified in Chapter 16, Structural, for the structure's seismic design category and soil classification at the project site.

For the reasons stated above including the project's incorporation of public works' SCM #1, Seismic Studies, the proposed project or project variants would not expose persons or structures to substantial adverse effects related to ground shaking and would not exacerbate existing conditions related to ground shaking, and the impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Liquefaction

Liquefaction is a phenomenon that occurs when loose, saturated, or silty soils contract as a result of a strong ground shaking event. The soil contraction causes the soil to lose shear strength by increasing the pore pressure.[166] As part of the geotechnical investigation, liquefaction analysis was conducted for the proposed project or project variants. The analysis concluded that there is a low potential for the triggering of liquefaction at the site.[167] Additionally, the

[166] Geotechnical Report, p. 9.
[167] Geotechnical Report, p. 9.

project site is not located within a mapped liquefaction hazard zone.[168,169] Because the soils at the project site are not susceptible to liquefaction, the proposed project or project variants would not expose persons or structures to substantial adverse effects related to liquefaction, and would not exacerbate existing conditions related to liquefaction, and the impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Seismic Densification

Seismic densification is a phenomenon that can occur during strong seismic shaking in loose, clean granular deposits above the water table, resulting in ground surface settlement that can cause damage to overlying structures. As noted in the geotechnical report and existing setting section above, portions of the project site above the bedrock contain loose clayey sand and silty sand.[170] These soils may densify during an earthquake. However, excavation for the proposed project or project variants would remove soil susceptible to seismic densification. Further, as recommended by the geotechnical report, the proposed project or project variants could be supported on foundations (spread footing or mat slab for the shallow east/northeast portion and driven or drilled piles for the deeper portion); all bearing on bedrock associated with the Franciscan Formation, which consists of weathered shale and serpentinite rock. As such, the proposed project or project variants would not be constructed on unstable soils susceptible to seismic densification and the impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Impact GE-2: The proposed project or project variants would not result in substantial loss of topsoil or erosion. (*Less than Significant*)

The project site is composed of an existing maintenance and operations building and other impervious surfaces (e.g., the paved bus storage yard including the bus wash area and running repair station).

As soils are exposed and moved during site preparation and excavation activities, they would be subject to wind- and water-borne erosion. The SFMTA and private project co-sponsor would be required to develop and implement an erosion and sediment control plan for construction activities in accordance with public works code article 4.2. Compliance with this section of the public works code would also be required pursuant to public works' SCM #3, Water Quality. The SFPUC must review and approve the erosion and sediment control plan prior to the plan's implementation. Contractors and site supervisors are responsible for ensuring that best management practices are implemented and maintained throughout the construction process, and failure to comply would result in citation and civil penalties. Erosion and sediment control best management practices would be implemented to minimize and stabilize disturbed areas, protect slopes and channels, control the site perimeter, and retain sediment. Examples of best management practices include check dams, silt fencings, catch basins, and proper waste storage

[168] Community Safety Element, Map 4 (Seismic Hazard Zones San Francisco, 2012).

[169] State of California, Seismic Hazard Zones, City and County of San Francisco, Official Map, November 17, 2000, *https://sfgov.org/esip/sites/default/files/FileCenter/Documents/10438-California%20Seismic%20Hazard%20Zones%20Map.pdf*, March 26, 2021.

[170] Geotechnical Report, p. 27.

and disposal.[171] The SFMTA and private project co-sponsor would also be required to develop and implement a site-specific dust control plan, pursuant to section 1242 of the health code and public works' SCM #4, Air Quality. The project sponsor would implement best management practices specified in the erosion and sediment control plan and the dust control plan, which would reduce construction impacts related to erosion and the loss of topsoil to less-than-significant levels.

At project buildout, the project site would be more intensely developed and landscaped, with limited open areas susceptible to erosion or loss of topsoil. Therefore, operation of the proposed project or project variants would have a less-than-significant impact related to soil erosion and loss of topsoil, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact GE-3: The proposed project or project variants would not be located on a geologic unit or soil that is unstable, or that could become unstable as a result of the project, resulting in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse. (*Less than Significant*)

The project site is underlain with dense to very dense, stiff to very stiff clay, and weathered bedrock. As noted above under Impact GE-1, the project site is largely flat and is not located in an area designated as being susceptible to earthquake-induced landslides or liquefaction.[172,173] Lateral spreading is a phenomenon that occurs as surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Because the soils at the project site are not likely to trigger liquefaction, foundations would be installed on bedrock and stable soils (i.e., soils that contain low moisture content and high load bearing capacity), and the proposed excavation depth would extend beneath the groundwater table, the potential for settlement leading to unstable soils, lateral spreading, and subsidence would be very low. Therefore, the impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Because excavation would extend to 35 feet below ground surface—below the depth where perched groundwater was encountered (9 feet below ground surface), the design groundwater level of 20 feet, and the estimated groundwater table (approximately 33 feet below ground surface)[174]—temporary dewatering of groundwater would be required to gain adequate foundation support and during drilling for pile foundations or for utility trenching. Dewatering would be limited to construction and would not be expected to result in subsidence. Further, the SFMTA and private project co-sponsor would adhere to state building code Chapter 18, Soils and Foundations, which provides the parameters for geotechnical reports and structural considerations in the selection, design, and installation of foundation systems including foundation walls and retaining walls. Adherence to building code requirements would minimize any risk of damage to onsite or offsite structures and adjacent sidewalks.

[171] SFPUC, Construction Best Management Practices Handbook, August 2013, Chapter 4, *https://sfwater.org/modules/showdocument.aspx?documentid=4282*, accessed March 26, 2021.

[172] Community Safety Element, Map 4 (Seismic Hazard Zones San Francisco, 2012).

[173] State of California, Seismic Hazard Zones, City and County of San Francisco, Official Map, November 17, 2000, *https://sfgov.org/esip/sites/default/files/FileCenter/Documents/10438-California%20Seismic%20Hazard%20Zones%20Map.pdf*, accessed March 26, 2021.

[174] Geotechnical Report, p. 41.

Given the above, the proposed project or project variants would not be located on an unstable geologic unit or soils or cause a geologic unit or soils to become unstable, potentially resulting in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse. Therefore, the impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact GE-4: The proposed project or project variants would not be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property. (*Less than Significant*)

Expansive soils expand and contract in response to changes in soil moisture, creating potential impacts to structures supported by the soil. The soil layers overlying the bedrock generally comprise dense to very dense sand, loose to very dense clayey sand, and stiff to very stiff sandy clay, which generally have no to slight plasticity, meaning the liquid limit of the soil is low and their expansive quality is minimal.[175,176] Any soil layers that may exhibit expansive qualities would be above the excavation depth. The proposed building would be supported on foundations bearing on bedrock with minimal expansive potential. Therefore, the proposed project or project variants would not be located on expansive soil that would create or exacerbate a substantial risk to life or property, and the impact would be less than significant. Mitigation measures are not required. This topic will not be discussed in the EIR.

Impact GE-5: The proposed project or project variants would not directly or indirectly destroy a unique geologic feature. (*No Impact*)

A unique geologic or physical feature embodies distinctive characteristics of any regional or local geologic principles, provides a key piece of information important to geologic history, contains minerals not known to occur elsewhere in the county, and/or is used as a teaching tool. No unique geologic features exist at the project site; therefore, no impacts on unique geological features would occur. Mitigation measures are not required. This topic will not be discussed in the EIR.

Impact GE-6: The proposed project or project variants could directly or indirectly destroy a unique paleontological resource or site. (*Less than Significant with Mitigation*)

Paleontological resources are the fossilized evidence of past life found in the geologic record. Fossils are preserved in sedimentary rocks, which are the most abundant rock type exposed at the surface of the earth. Despite the abundance of these rocks, and the vast numbers of organisms that have lived through time, preservation of plant or animal remains as fossils can be a rare occurrence. In many cases, fossils of animals and plants occur only in limited areas and in small numbers relative to the distribution of the living organisms they represent. Fossils of vertebrates—animals with backbones—are sufficiently rare to be considered nonrenewable resources.

The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping classifications of soil units can be used for assessing the potential for

[175] Geotechnical Report, p. 21.
[176] Geotechnical Report, Appendix C, Borehole Logs.

the occurrence of paleontological resources.[177] Most fossils in San Francisco and the San Francisco Peninsula are found along the Pacific Coast in marine units, such as the Purisima Formation, Monterey Formation, Butano Formation, Colma Formation, and Merced Formation, and in locations within the outcropping marine units in the Santa Cruz Mountains. Fossils found along the coast include vertebrates (e.g., extinct camels, horses, and sea mammals) and invertebrates (e.g., clams, snails, echinoderms, and crustaceans). Fossil localities diminish along the eastern flank of the Santa Cruz Mountains, likely due to the presence of chaotically mixed and severely fractured Franciscan Complex bedrock and geologically younger alluvial deposits in the upland foothills.

Geologic Setting

The following information is provided as context for the paleontological resources analysis for initial study checklist topic E.16(f). San Francisco is primarily underlain by Franciscan Complex bedrock, Merced Formation, Colma Formation, and surficial deposits such as dune sand and artificial fill. The surficial sedimentary deposits found in the City are primarily Holocene-age artificial fill; Holocene- and Pleistocene-age dune sand, bay mud, slope debris and ravine fill; and undifferentiated Quaternary[178] (i.e., Holocene- or Pleistocene-age) sedimentary deposits. Small portions of San Francisco are also underlain by igneous rocks which do not contain fossils. Fossils are typically found in river, lake, and bog deposits, although they may occur in nearly any type of sedimentary sequence. As mentioned above, the potential for paleontological discoveries can largely be predicted from the type of geologic units present.

Note that significance may also be stated for a particular rock unit, predicated on the research potential of fossils suspected to occur in that unit. Such significance is often stated as "sensitivity" or "potential." In most cases, decisions about how to manage paleontological resources must be based on this potential because the actual situation cannot be known until construction excavation for the project is underway. As such, a brief discussion of the geologic units commonly encountered in San Francisco and the paleontological resource potential of each is provided below.

Franciscan Complex

The Franciscan Complex is a Cretaceous- to Jurassic-age mixture of sedimentary, igneous, and metamorphic rocks that sits unconformably (indicating a gap in time) on the older bedrock that underlies much of San Francisco Bay. Although uncommon in the low-grade metamorphic Franciscan rocks, fossils from widely scattered localities have been important in sorting out the depositional history of the Franciscan Complex. The Franciscan Formation has a low potential to support significant paleontological resources because it is heavily deformed and metamorphosed in most locations.

[177] Bureau of Land Management, Potential Fossil Yield Classification System for Paleontological Resources on Public Lands, July 8, 2016, *https://www.blm.gov/sites/blm.gov/files/uploads/IM2016-124_att1.pdf*, accessed March 26, 2021.

[178] Quaternary is relating to or denoting the most recent period in the Cenozoic era in the International Geologic Time Scale, following the Tertiary period and comprising the Pleistocene and Holocene epochs (and thus including the present). International Commission on Stratigraphy. Available at International Union of Geological Sciences, online at *https://www.iugs.org/ics*, accessed March 26, 2021.

Merced Formation

The Pleistocene- to Pliocene-age Merced formation is composed of marine sand, silt, and clay, with minor amounts of gravel, lignite, and volcanic ash that was deposited in a small sedimentary basin formed by the San Andreas fault system. A search of the fossil collections database at the University of California Museum of Paleontology (UCMP) identified the fossil remains of nine vertebrate mammals collected at Fort Funston Beach, located in the southwest area of San Francisco, from the Merced Formation. In addition to these UCMP recorded fossils, the National Park Service Golden Gate National Recreation Area guidance document also identified trace fossils (marks left behind by organisms, such as trackways, burrows, footprints, or feces), a wing of a beetle, clams, terrestrial mammal remains (camels, mammoths, whales, and bison), bird remains (common murre), and diatoms (major group of algae that leaves silica remains).[179]

Colma Formation

The Pleistocene-age Colma Formation is mostly comprised of sandy deposits laid down between 80,000 and 120,000 years ago, during the last major interglacial period. The origins of the poorly consolidated Colma sands are unclear, but they appear to represent shallow bay-to-dune, and valley-fill debris deposits. The formation extends under the San Francisco Bay and may be found as high as 500 feet above sea level.

As described in more detail in the following subsection on surficial sediments, identified fossils within this formation include mammoth, bison, and ground sloth remains from various locations in San Francisco. Diatoms, trees, and pollen have also been reported from the Colma Formation.

Surficial Sediments

Surficial sediments within the City are Holocene to Pleistocene in age. Holocene-age sediments are typically too young to contain fossils,[180] but they may overlie sensitive older (i.e., Pleistocene- to Pliocene-age) deposits at various depths within the City. Pleistocene-age sediments have produced significant vertebrate fossils throughout California, including the Bay Area. Recently discovered Pleistocene vertebrate fossils near San Francisco Bay include Mammuthus columbi, Paramylodon harlani, Equus sp., Bison sp., and Capromeryx minor (pronghorn antelope), among other taxa.[181]

Soils and bedrock underlying the project site would be disturbed by project grading and excavation. The results of the geotechnical report prepared for the proposed project indicate that the project site is underlain by dense to very dense sand, loose to very dense clayey sand, and stiff to very stiff sandy clay over weathered bedrock consisting of serpentinite. As noted in the geotechnical report, the soil profile varies significantly across the project site.[182] The

[179] Henkel, C.J., W.P. Elder, V.L. Santucci and E.C. Clites. 2015. Golden Gate National Recreation Area: Paleontological resource inventory. Natural Resource Report NPS/GOGA/NRR-2015/915. National Park Service, Fort Collins, Colorado.

[180] Society of Vertebrate Paleontology's 2010 Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.

[181] Maguire, K.C. and P.C. Holroyd. 2016. Pleistocene Vertebrates of Silicon Valley (Santa Clara County). PaleoBios, v. 33, no 1, p. 1–14.

[182] Geotechnical Report, Appendix C.

upper surface of the Colma Formation is present at depths of 5 to 14 feet below present parcel grade. The Colma Formation (and, variably, bedrock) at the site are overlain by clayey sand, and by an uppermost layer of fill or disturbed native soil that ranges from 1 to 6 feet thick, as observed on geotechnical cores.[183] Weathered bedrock is present near the ground surface in the northeast corner of the site and dips steeply towards the southwest corner of the site (Mariposa and Bryant streets) where it is approximately 69 feet below ground surface. These soils and bedrock are characteristic of the Colma and Franciscan formations, described above The oldest rocks within this formation date from the late Jurassic period (approximately 150 million years before present) of the Mesozoic era.[184] The Colma and Franciscan formations that underlie the project site have moderate and low potential for fossil yield, respectively.

Excavation activities across the whole project site for the basement level and/or foundations could vary from a minimum depth near northwest corner for the shallow portion of the foundation to a maximum depth on the other portions of the project site where the bedrock dips steeply (i.e., the west, south-central and southeast portions) for the deep foundation with driven or drilled piles that could extend beyond 69 feet to reach bedrock. Excavation on the western portion of the site would likely extend into soils that are characteristic of the Colma Formation, while that on the east side would encounter bedrock of the Franciscan Formation. Because these geologic deposits have low to moderate paleontological sensitivity, excavation activities could expose and cause impacts on unknown paleontological resources, which would be a potentially significant impact. For paleontologically sensitive areas, the objective of implementing mitigation measures is to reduce adverse impacts on paleontological resources by recovering fossils and associated contextual data prior to and during ground-disturbing activities. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-GE-6a: Inadvertent Discovery of Paleontological Resources and Mitigation Measure-GE-6b: Preconstruction Paleontological Monitoring Report.

Mitigation Measure M-GE-6a: Inadvertent Discovery of Paleontological Resources

Worker Awareness Training - Prior to commencing construction, and ongoing throughout ground disturbing activities (e.g., excavation, utility installation, the project sponsor and/or their designee shall ensure that all project construction workers are trained on the contents of the Paleontological Resources Alert Sheet, as provided by the Planning Department. The Paleontological Resources Alert Sheet shall be prominently displayed at the construction site during ground disturbing activities for reference regarding potential paleontological resources.

In addition, the project sponsor team shall inform the contractor and construction personnel of the immediate stop work procedures and other procedures to be followed if bones or other potential fossils are unearthed at the project site. Should new workers that will be involved in ground disturbing construction activities begin employment after the initial training has occurred, the construction supervisor shall ensure that they receive the worker awareness training as described above.

[183] Arup/RYCG Joint Venture, Geotechnical Engineering Report, San Francisco Public Works, SFMTA Potrero Facility Rebuild, November 2019.

[184] Unites States Department of the Interior, Geological Survey, Geology of the San Francisco North Quadrangle, California (Schlocker, Julius), Geological Survey Professional Paper 782, 1974, pp. 9-73, *https://pubs.er.usgs.gov/publication/pp782*, accessed March 26, 2021.

The project sponsor team shall complete the standard form/affidavit confirming the timing of the worker awareness training to the Environmental Review Officer (ERO). The affidavit shall confirm the project's location, the date of training, the location of the informational handout display, and the number of participants. The affidavit shall be transmitted to the ERO within five (5) business days of conducting the training.

Paleontological Resource Discoveries - In the event of the discovery of an unanticipated paleontological resource during project construction, ground disturbing activities shall temporarily be halted within 25 feet of the find until the discovery is examined by a qualified paleontologist as recommended by the Society of Vertebrate Paleontology standards (SVP 2010) and Best Practices in Mitigation Paleontology (Murphey et al. 2019). Work within the sensitive area shall resume only when deemed appropriate by the qualified paleontologist in consultation with the ERO.

The qualified paleontologist shall determine: 1) if the discovery is scientifically significant; 2) the necessity for involving other responsible or resource agencies and stakeholders, if required or determined applicable; and 3) methods for resource recovery. If a paleontological resource assessment results in a determination that the resource is not scientifically important, this conclusion shall be documented in a Paleontological Evaluation Letter to demonstrate compliance with applicable statutory requirements (e.g., Federal Antiquities Act of 1906, CEQA Guidelines Section 15064.5, California Public Resources Code Chapter 17, Section 5097.5, Paleontological Resources Preservation Act 2009). The Paleontological Evaluation Letter shall be submitted to the ERO for review within 30 days of the discovery.

If the qualified paleontologist determines that a paleontological resource is of scientific importance, and there are no feasible measures to avoid disturbing this paleontological resource, the qualified paleontologist shall prepare a Paleontological Mitigation Program. The mitigation program shall include measures to fully document and recover the resource of scientific importance. The qualified paleontologist shall submit the mitigation program to the ERO for review and approval within 10 business days of the discovery. Upon approval by the ERO, ground disturbing activities in the project area shall resume and be monitored as determined by the qualified paleontologist for the duration of such activities.

The mitigation program shall include: 1) procedures for construction monitoring at the project site; 2) fossil preparation and identification procedures; 3) curation of paleontological resources of scientific importance into an appropriate repository; and 4) preparation of a Paleontological Resources Report (report or paleontology report) at the conclusion of ground disturbing activities. The report shall include dates of field work, results of monitoring, fossil identifications to the lowest possible taxonomic level, analysis of the fossil collection, a discussion of the scientific significance of the fossil collection, conclusions, locality forms, an itemized list of specimens, and a repository receipt from the curation facility. The project sponsor team shall be responsible for the preparation and implementation of the mitigation program, in addition to any costs necessary to prepare and identify collected fossils, and for any curation fees charged by the paleontological repository. The paleontology report shall be submitted to the ERO for review within 30 business days from conclusion of ground disturbing activities, or as negotiated following consultation with the ERO.

Mitigation Measure M-GE-6b: Preconstruction Paleontological Evaluation and Monitoring Plan during Construction

The project sponsor team shall engage a qualified paleontologist to develop a site-specific monitoring plan prior to commencing soil-disturbing activities at the project site. The Preconstruction Paleontological Monitoring Plan would determine project construction activities requiring paleontological monitoring based on those may affect sediments with moderate sensitivity for paleontological resources. Prior to issuance of any demolition permit, the project sponsor team shall submit the Preconstruction Paleontological Monitoring Plan to the ERO for approval.

At a minimum, the plan shall include:

1. Project Description
2. Regulatory Environment – outline applicable federal, state, and local regulations
3. Summary of Sensitivity Classification
4. Research Methods, including but not limited to:

    4.a. Field studies conducted by the approved paleontologist to check for fossils at the surface and assess the exposed sediments.

    4.b. Literature Review to include an examination of geologic maps and a review of relevant geological and paleontological literature to determine the nature of geologic units in the project area.

    4.c. Locality Search to include outreach to the University of California Museum of Paleontology in Berkeley.

5. Results: to include a summary of literature review and finding of potential site sensitivity for paleontological resources; and depth of potential resources if known.
6. Recommendations for any additional measures that could be necessary to avoid or reduce any adverse impacts to recorded and/or inadvertently discovered paleontological resources of scientific importance. Such measures could include:

    6.a. Avoidance: If a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation.

    6.b. Fossil Recovery: If isolated small, medium- or large-sized fossils are discovered within a project area during field surveys or construction monitoring, and they are determined to be scientifically significant, they should be recovered. Fossil recovery may involve simply collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending upon the size and complexity of the fossil discovery.

    6.c. Monitoring: Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other types of construction excavations for the presence of fossils, and the fossil recovery and documentation of these fossils before they are destroyed by further ground disturbing actions. Standard monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (moderate, high, and very high potential); while spot-check monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (moderate or unknown potential).

    6.d. Data recovery and reporting: Fossil and associated data discovered during soils disturbing activities should be treated according to professional paleontological standards and documented in a data recovery report. The plan should define the scope of the data recovery report.

    The consultant shall document the monitoring conducted according to the monitoring plan and any data recovery completed for significant paleontological resource finds discovered, if any. Plans and reports prepared by the consultant shall be considered draft reports subject to revision until final approval by the ERO. The final monitoring report and any data recovery report shall be submitted to the ERO prior to the certificate of occupancy.

Mitigation Measures M-GE-6a and M-GE-6b would reduce potential adverse effects on paleontological resources by recovering fossils and associated contextual data prior to and during ground-disturbing activities; therefore, the

proposed project or project variants would have a less-than-significant impact on paleontological resources. The mitigation measures will be included in the project's mitigation monitoring and reporting program. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-GE-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative impacts related to geology, soils and paleontological resources. (*Less than Significant*)

Geology, soils, and paleontological resource impacts are generally site-specific and localized. The closest cumulative projects that would include below-grade work are across Mariposa and Bryant streets – 2601 Mariposa Street (improvements to existing foundation to support building load for single floor vertical addition and other interior improvements) and 1850 Bryant Street (excavation for new construction). All other projects would be further away from the project site. Although the closest cumulative projects could require various levels of excavation and grading, it is unlikely they will combine to result in cumulative impacts on geology, soils, and paleontological resources.

Further, these cumulative projects are also subject to the same department of building inspection requirements for geotechnical review and would be required to comply with the state and local building codes, implementing procedures, regulations, and guidelines including mandatory or local seismic safety standards. As such, the department of building inspection will review project-specific geotechnical reports during review of building permits for cumulative projects for conformance with recommendations in the geotechnical reports, based on site conditions. For the above reasons, the proposed project or project variants and nearby cumulative projects would result in a less-than-significant cumulative impact on geology, soils, or paleontological resources.

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E.17 Hydrology and Water Quality

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
17. HYDROLOGY AND WATER QUALITY. Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:	☐	☐	☒	☐	☐
i) Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐	☐
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐	☐
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐	☐
iv) Impede or redirect flood flows?	☐	☐	☒	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☐	☒
e) Conflict or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐	☐

Summary of Hydrology and Water Quality Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to hydrology and water quality (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

Regarding initial study checklist topic E.17(d), according to the SFPUC's 100-Year Storm Flood Risk Map, the project site is not located within a 100-year flood hazard area,[185] or in an area identified as being subject to potential

[185] City and County of San Francisco, 100-Year Storm Flood Risk Map, July 2019, *https://sfplanninggis.org/floodmap/*, accessed March 26, 2021.

inundation in the event of a tsunami along the San Francisco coast or a dam or levee failure.[186] Therefore, the proposed project or project variants would not create a risk related to a release of pollutants due to inundation in a flood hazard, tsunami, or seiche zone. As such, initial study checklist topic E.17(d) is not applicable to the proposed project or project variants and is not discussed below or further in the EIR. The remaining initial study checklist topics for the hydrology and water quality analysis are discussed below.

As stated in Section D, Summary of Environmental Effects, p. 11, and EIR Chapter 2, Project Description, pp. 2.49-2.54, proposed project or project variants would be subject to public works' SCMs. SCM #3, Water Quality, requires all projects to:

- Prepare either a stormwater control plan or a stormwater pollution prevention plan, and
- implement tailored erosion and sedimentation controls to prevent potential discharges of sediment and other pollutants to storm drains and all surface waterways.

Furthermore, SCM #3 requires that if uncontaminated groundwater is encountered during excavation activities, it will be discharged in compliance with applicable water quality standards and discharge permit requirements (see public works' SCM#6, Hazardous Materials for contaminated groundwater). Through implementation of applicable measures, significant hydrology and water quality impacts associated with accidental sediment and hazardous materials discharges would be avoided (see EIR Appendix C).

Impact HY-1: The proposed project or project variants would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality, create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, or conflict with or obstruct implementation of a water quality control plan. (*Less than Significant*)

Construction Dewatering and Stormwater Runoff

The proposed project or project variants would involve excavation to a maximum depth of 35 feet below ground surface for construction of the building foundation and below-grade basement level. Excavation activities would require dewatering, given that perched groundwater was encountered at depth of 9 feet below ground surface and the groundwater table is located at approximately 33 feet below ground surface.[187] If wells are used for groundwater dewatering during construction, the project would comply with article 12B of the health code (Soil Boring and Well Regulations Ordinance)[188], which requires approvals from both the San Francisco Department of Public Health (health department) and the SFPUC. Any groundwater encountered during construction would be subject to the requirements of public works code article 4.1, which include the requirement that groundwater meet specified

[186] City and County of San Francisco, Community Safety Element of the San Francisco General Plan, 2012 (hereinafter referred to as "Community Safety Element"), Map 5 (Tsunami Hazard Zones San Francisco) and Map 6 (Potential Inundation Areas Due to Reservoir Failure), *https://generalplan.sfplanning.org/Community_Safety_Element_2012.pdf*, accessed March 26, 2021.

[187] Geotechnical Report, p. 41.

[188] San Francisco Health Code, Article 12B, Soil Boring and Well Regulations *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_health/0-0-0-2288*, accessed March 26, 2021.

water quality standards before it is discharged into the sewer system. The SFPUC must be notified regarding projects that necessitate dewatering and obtain a Batch Wastewater Discharge Permit from the SFPUC Wastewater Enterprise Collection System Division prior to any dewatering activities. The SFPUC may require additional water analysis prior to permit approval.

During construction, the proposed project or project variants would be required to comply with public works code article 4.2. Specifically, the proposed project or project variants would comply with public works code section 146.7 by implementing an erosion and sediment control plan. Compliance with this section of the public works code would also be required pursuant to public works' SCM #3, Water Quality, and SCM #6, Hazardous Materials. The erosion and sediment control plan would identify best management practices and tailored erosion and sedimentation control measures to prevent sediment from entering the City's combined sewer system. The construction best management practices that would most likely be implemented as part of the proposed project or project variants would address inspection and maintenance, water conservation, spill prevention and control, street cleaning, and prevention of illicit connection and discharge. These best management practices would minimize disturbance to the project site, adjacent areas, and storm drains and would prevent sediment from entering the combined sewer system. The SFPUC's Construction Runoff Control Program staff enforces this requirement through periodic and unplanned site inspections. In addition, prior to the commencement of any land-disturbing activities, the project sponsor would be required to obtain a construction site runoff control permit.

Construction stormwater discharged to the City's combined sewer system would be subject to the requirements of public works code article 4.1, which incorporates the requirements of the City's National Pollutant Discharge Elimination System (NPDES) permit and the federal Combined Sewer Overflow Control Policy. Stormwater drainage during construction would flow to the City's combined sewer system, where it would receive treatment at the Southeast Water Pollution Control Plant and be discharged through an existing outfall or overflow structure in compliance with the existing pollutant discharge permit. Therefore, the proposed project's or project variants' compliance with applicable permits and regulatory requirements would reduce water quality impacts during construction and dewatering activities.

Operational Wastewater and Stormwater Discharges

During operation, wastewater discharges would be related to the expanded transit use and the new residential and commercial uses. Stormwater discharges would include runoff from streets, sidewalks, and other impervious surfaces. The proposed project or project variants would pre-treat stormwater to draw out pollutants, reduce peak flows, and to recharge groundwater.[189] Discharges from the proposed project or project variants would be subject to the permit requirements of public works code article 4.1[190] and supplemented by public works order

[189] Design Criteria Document, Version 2, p. 37.

[190] San Francisco Public Works Code, Article 4.1, Industrial Waste, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_publicworks/0-0-0-441*, accessed March 26, 2021.

no. 158170.[191] Wastewater and stormwater generated at the project site would be directed to the City's combined sewer system and treated to the standards of the National Pollutant Discharge Elimination System (NPDES) permit for the Southeast Water Pollution Control Plant prior to discharge to San Francisco Bay.

The proposed project or project variants would be required to implement a stormwater control plan in accordance with the City's stormwater management ordinance. The SFMTA and private project co-sponsor would be required to submit a stormwater control plan for review and approval by the SFPUC. The stormwater control plan must comply with the Stormwater Design Guidelines and meet performance measures set by the SFPUC related to the proposed project's or project variants' stormwater runoff rate and volume. To ensure the proposed project or project variants meet the SFPUC's requirements, low-impact development features are proposed and would include a stormwater catchment system designed using best management practices in accordance with existing SFPUC regulations and standards. Additionally, as discussed under Impact UT-3 in initial study Section E.13, Utilities and Service Systems, the proposed project or project variants would incorporate low-impact design features to limit the amount of water entering the combined sewer system. Therefore, the proposed project or project variants would implement stormwater, rainwater, and graywater capture systems for onsite reuse. Captured stormwater, rainwater, and graywater would be held in a system of tanks located in the proposed basement level. The captured water flows would be treated and reused onsite for the SFMTA bus wash system, for landscape irrigation, and as flush water, or treated and discharged to the combined sewer system and conveyed to the Southeast Water Pollution Control Plant. These features would be designed to reduce the stormwater peak flow and volume from a two-year, 24-hour storm event by at least 25 percent, as required. This would reduce peak flows entering the combined sewer system during wet-weather events and minimize the potential for downstream or localized flooding.[192] Compliance with San Francisco's Stormwater Design Guidelines would reduce the quantity and rate of stormwater runoff to the City's combined sewer system and improve the water quality of those discharges.

In summary, the proposed project's or project variants' construction and operational activities would not result in significant water quality impacts or obstruct implementation of a water quality control plan. Furthermore, the proposed project or project variants would not violate water quality standards or release substantial additional sources of polluted runoff. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

[191] City and County of San Francisco, San Francisco Department of Public Works Order No. 158170, Industrial Waste Discharge Limits into City's Sewerage System, 2008, *https://infrastructure.sfwater.org/fds/fds.aspx?lib=SFPUC&doc=619040&data=238330400*, accessed March 26, 2021.

[192] SFPUC, Stormwater Management Requirements and Design Guidelines, 2016, *https://sfwater.org/Modules/ShowDocument.aspx?documentID=9026*, accessed March 26, 2021.

Impact HY-2: The proposed project or project variants would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin, nor would it conflict with a sustainable groundwater management plan. (*Less than Significant*)

The project site is located in the Downtown San Francisco Groundwater Basin. This basin is not used as a potable water source and there are no plans for development of this basin for groundwater production. Therefore, a sustainable groundwater management plan has not been adopted for the Downtown San Francisco Groundwater Basin. The project site is currently developed with a maintenance and operations building and paved bus storage yard and is completely covered with impervious surfaces. The proposed project or project variants would not increase the amount of impervious surface at the project site and would therefore not alter groundwater infiltration and runoff patterns on the project site beyond that required to meet the Stormwater Management Ordinance, i.e., a 25 percent stormwater peak flow and volume reduction.

The geotechnical report prepared for the proposed project or project variants assumed a design groundwater level of 20 feet below ground surface for purposes of the foundation capacity analysis assessment. The geotechnical investigation encountered perched groundwater at 9 feet below ground surface with the groundwater table at approximately 33 feet; however, groundwater levels in the area are likely to fluctuate, with historical records indicating the potential for groundwater within 10 feet of the existing ground surface.[193] The project site would be excavated to a depth of approximately 35 feet below ground surface (including over excavation for allowance of engineered fill, elevator pits and lower level work areas). Because groundwater would likely be encountered during excavation, dewatering would be required during construction. If wells are used for groundwater dewatering during construction, the project would comply with health code article 12B, which requires approvals from both the health department and the SFPUC. Once dewatering is completed, groundwater levels would return to normal. The proposed project or project variants would not require long-term dewatering and would not be expected to extract any underlying groundwater supplies. Therefore, the proposed project or project variants would not substantially deplete groundwater resources, interfere with groundwater recharge, or conflict with a sustainable groundwater management plan. Impacts related to groundwater would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact HY-3: The proposed project or project variants would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation onsite or offsite; substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite; or impede or redirect flood flows. (*Less than Significant*)

The project site is covered entirely by impervious surfaces and has no streams or creeks. The proposed project or project variants would not expand any existing impervious surfaces; therefore, site drainage would remain generally the same as under existing conditions. Through implementation of low-impact design measures as required by the City's Stormwater Management Ordinance and Stormwater Management Requirements and Design Guidelines, the

[193] Geotechnical Report, p. 41.

proposed project or project variants would incrementally reduce the amount of surface water runoff from the project site. Specifically, the proposed project or project variants would be required to reduce the existing stormwater runoff rate and volume at the project site by 25 percent for a two-year 24-hour design storm with the implementation of low-impact design measures. The proposed project or project variants would meet this requirement by installing stormwater and rainwater catchments systems to manage onsite stormwater and using permeable pavement or other low-impact design features as part of the streetscape to promote infiltration, e.g., the proposed landscaping along 17th Street and street tree wells along the adjacent sidewalks. Therefore, the proposed project or project variants would not be expected to result in substantial erosion or flooding associated with changes in drainage patterns. The impact of the proposed project or project variants related to potential erosion or flooding would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Cumulative Impacts

Impact C-HY-1: The proposed project or project variants, in combination with other cumulative projects, would not result in significant cumulative impacts on hydrology and water quality. (*Less than Significant*)

Cumulative projects in the vicinity (see EIR Table 3.A.1 and EIR Figure 3.A.1 on pp. 3.A.7-3.A.9) would result in an intensification of land uses, a cumulative increase in water consumption, a cumulative increase in stormwater runoff, and a cumulative increase in stormwater and wastewater generation. Increases would result in cumulative impacts to wastewater, stormwater, and groundwater, as described below. The SFPUC has accounted for such growth in its service projections through 2040.[194] The SFPUC's infrastructure capacity plans account for projected population and employment growth in relation to the capacity of its collection, storage, and treatment system.[195]

Water quality impacts are related to changes in wastewater and stormwater flows to the Channel subdrainage area of the Bayside Drainage Basin. Wastewater and stormwater generated by the proposed project would be treated at the Southeast Water Pollution Control Plant. Therefore, the geographic scope of potential cumulative impacts on water quality encompasses the Channel subdrainage area of the combined sewer system where the project is located and the bay where the Southeast Water Pollution Control Plant effluent is discharged. Like the proposed project or project variants, construction and operation of cumulative projects within the Channel subdrainage area (including all cumulative projects listed in EIR Table 3.A.1) would require the implementation of and compliance with applicable regulatory requirements for hydrology and water quality, including the City's stormwater management ordinance and guidelines. As a result, cumulative development would not substantially change the amount of new impervious surface and all stormwater and wastewater would be treated to the standards in the City's NPDES permit. Therefore, cumulative impacts related to increased runoff and water quality would be less than significant.

[194] SFPUC, 2015 UWMP, Section 1, p. 1-1.

[195] SFPUC, San Francisco Sewer System Master Plan, 2010, *http://www.gestaltgraphics.com/docs/SFSSSummary.pdf*, accessed March 26, 2021. The Sewer System Master Plan evolved into the Sewer System Improvement Program and then the 2015 San Francisco Sewer System Management Plan.

With regards to groundwater dewatering, cumulative projects in the vicinity would be within the same groundwater basin as the proposed project or project variants (the Downtown Groundwater Basin). Dewatering associated with construction activities of cumulative projects, if needed based on excavation depths, would be temporary and limited to construction. Like the proposed project or project variants, construction of cumulative projects within the Downtown Groundwater Basin (including all cumulative projects listed in EIR Table 3.A.1) would require the implementation of and compliance with applicable regulatory requirements, including health code article 12B if groundwater wells are part of cumulative development. Like the proposed project or project variants, once any temporary groundwater dewatering is completed, groundwater levels would be expected to return to normal. The Downtown Groundwater Basin is not a potable water source; thus, like the proposed project or project variants, cumulative projects would not be expected to require long-term dewatering and would not propose to extract any underlying groundwater supplies. Therefore, cumulative impacts related to chronic lowering of groundwater levels or an unreasonable depletion of groundwater supply would be less than significant.

Cumulative projects listed in EIR Table 3.A.1 would drain to the Channel subdrainage area of the City's combined sewer system and could result in drainage system capacity or flooding impacts. Like the proposed project or project variants, compliance with applicable regulatory requirements designed to reduce the cumulative effects of development on drainage system capacity and flooding (i.e., the stormwater management ordinance) would ensure that cumulative projects would not result in any significant drainage system capacity or flooding impacts.

Overall, compliance with existing regulations would ensure that the proposed project or project variants in combination with cumulative projects in the immediate vicinity, in the Channel subdrainage area of the combined sewer system, and in San Francisco would result in less-than-significant cumulative impacts on hydrology and water quality. Mitigation measures are not required. This topic will not be discussed in the EIR.

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E.18 Hazards and Hazardous Materials

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
18. HAZARDS AND HAZARDOUS MATERIALS. Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☐	☒

Summary of Hazards and Hazardous Materials Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to hazards and hazardous materials (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

As stated in Section D, Summary of Environmental Effects, p. 11, and EIR Chapter 2, Project Description, pp. 2.49-2.54, the proposed project or project variants would be subject to public works' SCMs. SCM #6, Hazardous Materials, requires projects located in a Maher Zone that involve excavation of 50 cubic yards of soils to comply with the Maher

Ordinance.[196] It also requires projects that are not currently located on sites in a Maher Zone but have the potential to contain hazardous materials in soil and/or groundwater to be referred to the health department as newly identified Maher sites (see EIR Appendix C). SCM #6 requires a project sponsor to coordinate with health department staff, who oversee Maher compliance, to complete a screening assessment to determine (based on excavation volume, project site location, and need for a permit, e.g., grading, building, demolition) if a Maher Application is required. If enrollment in the Maher Program is required, health department staff determine the scope of additional studies and remedial actions as appropriate for the proposed uses.

Because the project site is located in a Maher Zone and project construction would require a building permit and exceed the 50-cubic-yard excavation volume threshold, the SFMTA consulted with the health department and submitted a Maher Application on January 27, 2020. The information in this section is based on the Phase II environmental site assessment[197], health department communications related to enrollment in the Maher Program, the submission of the Maher Application, and the health department's determination.[198] The section summarizes the environmental site assessment and the health department's determination of the required approach to site remediation in light of existing conditions. Through implementation of applicable measures, significant impacts related to hazardous materials would be avoided.

Impact HZ-1: The proposed project or project variants would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (*Less than Significant*)

The project site currently supports a bus storage yard and maintenance and operations building. This existing use involves the use, storage, and disposal of various hazardous materials typical of electric-powered automotive facilities, such as oils and lubricants. Hazardous waste generated from bus maintenance activities would continue to be hauled off site for disposal at a qualified waste disposal facility in accordance with relevant federal, state, and local regulations governing the handling of hazardous waste, as described below under "Operation." The batteries associated with the electric buses would be disposed of at a licensed recycling facility in accordance with applicable regulations such as Title 22 of the California Code of Regulations, Division 4.5, Chapter 23, which regulates the disposal and management of Universal Waste (including end-of-life rechargeable batteries in electric vehicles).

Construction

Project construction would involve the routine transport, use, or disposal of hazardous materials such as fuels, lubricants, paints, and solvents associated with construction vehicles, equipment, and supplies. Project construction would also involve the excavation of soil that is considered hazardous. The handling and disposal of contaminated soil is addressed below in Impact HZ-2.

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196 San Francisco Health Code, Article 22A: Analyzing Soils for Hazardous Waste, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_health/0-0-0-4093*, and San Francisco Building Code, Article 106A.3.2.4, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_building/0-0-0-92027*, accessed May 28, 2021.

197 AEW Engineering, Inc., Final Phase II, Environmental Site Assessment Report, June 2018, Figure 3 (hereinafter referred to as "Phase II ESA").

198 San Francisco Department of Public Health, Site Assessment and Mitigation Program, Phase II Subsurface Report Approval/Site Mitigation and Separate Dust Control Plan Request, 2500 Mariposa Street, May 14, 2020.

The construction contractor would be required to adhere to federal, state, and local regulations pertaining to the handling of hazardous materials. Relevant federal regulations include the Occupational Safety and Health Administration (OSHA), Title 29 of the Code of Federal Regulations, section 1910, which prescribes occupational safety and health standards related to the handling of hazardous materials and the use of personal protective equipment. Relevant state regulations include the California Occupational Safety and Health Administration (Cal/OSHA), Title 8 of the California Code of Regulations, which establishes occupational health and safety standards related to employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings. Title 8 of the California Code of Regulations also requires the construction contractor to implement a communication program that includes label warnings, safety data sheets, and information and training for workers about the chemicals to which they could be exposed.

Additionally, as described in initial study Section E.17, Hydrology and Water Quality, the proposed project or project variants would be subject to the State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit), which requires the preparation and implementation of a stormwater pollution prevention plan and the identification of best management practices designed to prevent the risk of sediment discharge. Relevant local regulations include public works code article 4.2, which requires the preparation and implementation of an Erosion and Sediment Control Plan. The erosion and sediment control plan would include site-specific best management practices designed to prevent discharge of hazardous materials. As stated there, compliance applicable regulations would also be ensured pursuant to public works' SCM #3, Water Quality, and SCM #6, Hazardous Materials.

In accordance with the stormwater pollution prevention plan and erosion and sediment control plan, which would be reviewed and approved by the SFPUC, the construction contractor would identify hazardous materials sources within the construction area and recommend site-specific best management practices to prevent discharge of these materials. The minimum best management practices that would be required include maintaining an inventory of materials used onsite; storing chemicals in water-tight containers protected from rain; developing a spill response plan and procedures to address hazardous and nonhazardous spills; maintaining spill cleanup equipment onsite; assigning and training spill response personnel; and preventing leaks of oil, grease, and fuel from equipment.

The construction contractor and/or vendors responsible for transporting hazardous materials would comply with Title 22 of the California Code of Regulations, Division 4.5, Chapters 13 and 29, which prescribe regulatory requirements for the transport of hazardous waste. In accordance with these regulations, all hazardous waste transporters must have identification numbers. Hazardous waste transporters must also comply with the California Vehicle Code, California Highway Patrol regulations (contained in Title 13 of the California Code of Regulations); the California State Fire Marshal regulations (contained in Title 19 of the California Code of Regulations); U.S. Department of Transportation regulations (Title 49 of the Code of Federal Regulations); and U.S. Environmental Protection Agency (EPA) regulations (contained in Title 40 of the Code of Federal Regulations).

Operation

Project operation for the expanded and modernized transit facility would involve an increase in the use of hazardous materials such as lubricants, grease, and oils associated with the operation and maintenance of SFMTA's expanded revenue and non-revenue fleet (buses [from 158 to 213] and non-revenue vehicles [from 56 to 97]). The SFMTA's current maintenance and operation activities would generally continue without any change to the transit facility's routine transport, use, or disposal of hazardous materials. The facility would also include the use of batteries for the project's all-electric bus fleet. After their operational life, batteries would be recycled at an appropriate licensed recycling facility in accordance with all applicable regulations.

The proposed residential and retail uses would involve the occasional use of relatively small quantities of common hazardous materials such as paints, cleaners, toners, solvents, and disinfectants for routine purposes. These products are labeled to inform users of potential risks and to instruct them in appropriate handling procedures. Routine use consumes or neutralizes most of these materials, resulting in little hazardous waste. The proposed project or project variants would also include three diesel-fueled engine generator sets for emergency/standby system loads (two associated with the transit use and one for the residential use) and storage tanks with a capacity to store 24 hours of fuel located in the basement and a mechanical equipment room on the rooftop of the residential component of the development along Mariposa Street.[199,200]

The proposed project or project variants would include parking for 213 buses and 97 non-revenue vehicles, which is 55 and 41 more parking spaces, respectively, than the existing maintenance and operations building currently has. As such, the proposed project or project variants would generate more waste associated with bus and non-revenue vehicle maintenance activities than it does under existing conditions. The use, storage, and transport of hazardous waste would be conducted in compliance with all applicable provisions provided in OSHA, Title 29 of the Code of Federal Regulations, section 1910, and Cal/OSHA. In addition, these activities would also be conducted in compliance with health code article 21. In accordance with article 21, any facility that handles hazardous materials, including hazardous wastes, in excess of specified quantities (i.e., 500 pounds for solids, 55 gallons for liquids, and 200 cubic feet for compressed gases) would be required to obtain a Certificate of Registration from the health department and to implement a Hazardous Materials Business Plan that includes inventories, a program for reducing the use of hazardous materials and generation of hazardous wastes, site layouts, a program and implementation plan for training all new employees and annual training for all employees, and emergency response procedures and plans.

The aboveground storage tanks for the diesel-fueled engine generator sets would be sited and maintained in compliance with all applicable laws and regulations such as the Aboveground Petroleum Storage Act, which requires the preparation of a Spill Prevention Control and Countermeasures Plan. The Spill Prevention Control and Countermeasures Plan details the procedures, equipment, and workforce commitment necessary for a business to

[199] Design Criteria Document, Version 2, Section 5.13 (Electrical), p. 96.
[200] Design Criteria Document, Version 2, Section 5.9 (Plumbing), p. 85.

prevent and contain oil discharges from its facility. Impacts related to emissions from the diesel generators are discussed in EIR Section 3.D, Air Quality.

For these reasons, the proposed project or project variants would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Thus, impacts would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact HZ-2: The proposed project or project variants would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (*Less than Significant*)

The site is located within a Maher zone, an area designated by the health department as containing hazardous substances in the soil or groundwater.[201] Excavation for proposed basement and foundation construction would remove approximately 248,900 cubic yards of soils and would extend into bedrock that contains naturally occurring asbestos.[202] As such, the project site was characterized in accordance with health code article 22A (Maher Ordinance).[203]

Soil samples were excavated from the project site and were evaluated against established regulatory screening criteria. Screening criteria are used to evaluate whether concentrations of chemicals in the soil exceed levels that would result in adverse effects to human health or the environment. The regulatory screening criteria consist of U.S. EPA's Regional Screening Levels, San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels, and the California EPA Department of Toxic Substances Control's modified screen levels for soil (DTSC-SLs).[204]

The results from the soil samples indicated that the samples contained various metals, hydrocarbons, volatile organic compounds, semi-volatile organic compounds (SVOCs), and pesticides and polychlorinated biphenyls identified as hazardous substances in Title 22 of the California Code of Regulations and subject to regulation governing waste generation, handling, storage, and disposal.[205] Of the substances subject to regulation under Title 22, metals (i.e., arsenic, cobalt, nickel), chromium VI, and SVOCs (i.e., benzo(a)pyrene and naphthalene) were detected in concentrations above their respective regulatory screening levels.[206]

The health department reviewed the documentation of onsite contamination related to the current and past site uses, and, based on their assessment and the associated documentation, determined that separate construction dust control and site mitigation plans would be required, and that further soil testing would be needed to determine

[201] Phase II ESA, Figure 3.
[202] Phase II ESA, June 2018, p. 1-1.
[203] The Maher ordinance requires the health department to oversee the characterization and mitigation of hazardous substances in soil or groundwater when project activities involve the disturbance of 50 or more cubic yards of soil in designated Maher zones. San Francisco Health Code, Article 22A: Analyzing Soils for Hazardous Waste, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_health/0-0-0-4093*, accessed May 28, 2021.
[204] Phase II ESA, pp. 4-1 - 4-2.
[205] Phase II ESA, p. 4-3.
[206] Phase II ESA, p. 4-6.

the full scope of site remediation under the site mitigation plan if soil excavation and disturbance extends beyond the limits identified in the submitted documentation.[207]

Construction

Contaminated Soil

During construction, particularly excavation and grading, construction workers could be exposed to chemicals in the soil (including those found in concentrations above their respective regulatory screening levels) and groundwater through skin contact, ingestion, or inhalation of airborne dust or vapors. The public, including nearby offsite residents, could be exposed to these chemicals through inhalation of airborne dust or vapors or contact with accumulated dust if proper precautions were not implemented.

To minimize the exposure of construction workers and the public to chemicals, prior to construction, a site mitigation plan and a demolition and construction dust control plan would be prepared in compliance with health code articles 22A and 22B (Construction Dust Control Requirements) for review and approval by the health department.[208] The demolition and construction dust control plan would include best management practices to reduce dust during construction, such as limiting travel on unpaved roads; wetting and tarping solid bulk material for offsite transport; and paving main access points to the project site. The site mitigation plan would include soil and groundwater handling procedures, designs for minimization measures that control human exposure to remaining hazardous substances, an environmental contingency plan, and a health and safety plan. Compliance with health code articles 22A and 22B would ensure that implementation of the proposed project or project variants would not create a significant hazard to the public or the environment through reasonably foreseeable conditions involving the release of hazardous materials into the environment. This impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Hazardous Building Materials

Demolition of the existing maintenance and operations building and paved bus yard would generate approximately 124,300 cubic yards of demolition debris.[209] Based on the age of the transit facility, hazardous building materials such as asbestos, lead-based paint, electrical transformers containing polychlorinated biphenyls (PCBs), fluorescent light ballasts containing PCBs or bis (2-ethylhexyl) phthalate (DEHP), and fluorescent light tubes containing mercury vapors may be present. If these materials are present, they could escape into the environment and pose health concerns for construction workers and the public if not properly handled or disposed of in accordance with applicable regulations.

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[207] San Francisco Department of Public Health, Site Assessment and Mitigation Program, Phase II Subsurface Report Approval/Site Mitigation and Separate Dust Control Plan Request, 2500 Mariposa Street, May 14, 2020.

[208] San Francisco Health Code, Article 22B: Construction Dust Control Requirements, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_health/0-0-0-4199*, and San Francisco Building Code, Article 106A.3.2.6, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_building/0-0-0-92027*, accessed May 28, 2021.

[209] City and County of San Francisco, E-mail communication between Tim Kempf, Project Manager, Public Works, and Ajay Singh, PMP, CPE, QSP, CQM, LEED AP BD+C, CISEC, Dabri Inc., August 11, 2020.

Demolition and construction activities would follow all applicable standards and regulations for hazardous building materials, including the California Health and Safety Code. Currently, section 19827.5 of the California Health and Safety Code requires local agencies to not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos.

The Bay Area Air Quality Management District (air district) is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement and is to be notified 10 days in advance of any proposed demolition or asbestos abatement work. The notification must include: (1) the address of the operation; (2) the names and addresses of those who are responsible; (3) the location and description of the structure to be altered, including size, age, prior use, and the approximate amount of friable (i.e., easily crumbled) asbestos; (4) scheduled start and completion dates for the asbestos abatement work; (5) nature of the planned work and methods to be employed; (6) procedures to be employed to meet the air district's requirements; and (7) the name and location of the waste disposal site to be used. The air district randomly inspects asbestos removal operations and will inspect any removal operation about which a complaint has been received. Any asbestos-containing building material disturbance at the project site would be subject to the requirements of the air quality management district's Regulation 11, Rule 2: Hazardous Materials; Asbestos Demolition, Renovation, and Manufacturing.

The local office of Cal/OSHA must also be notified of any asbestos abatement that is to be carried out. Asbestos abatement contractors must follow state regulations contained in Title 8 of the California Code of Regulations, section 1529, and Title 8, sections 341.6 through 341.14, where there is asbestos-related work involving 100 square feet or more of asbestos-containing building material. Asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California. The owner of the property where abatement is to occur must have a Hazardous Waste Generator Number assigned by and registered with the Office of the California Department of Health Services in Sacramento. The contractor and hauler of the material are required to file a Hazardous Waste Manifest that details the hauling of the material from the site and the disposal of it. Pursuant to California law, department of building inspection will not issue the required permit until the project sponsor has complied with the notice requirements described above.

If lead-based paint is present, demolition would be subject to the Cal/OSHA Lead in Construction Standard (Title 8 of the California Code of Regulations, section 1532.1), which requires development and implementation of a lead compliance plan when materials that contain lead would be disturbed during construction. The plan must describe activities that could emit lead, methods that will be used to comply with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA would require 24-hour notification if more than 100 square feet of materials that contain lead would be disturbed. Any other hazardous building materials identified either before or during demolition or renovation would be abated according to federal, state, and local laws and regulations.

If PCBs are present, disposal of PCBs would be subject to the Federal Toxic Substances Control Act, U.S. Code, Title 15, Chapter 53; and implementing regulations in Title 40 of the Code of Federal Regulations (40 CFR 761) and Title 22 of the California Code of Regulations (22 CCR 66261.24). Disposal of these materials as hazardous waste must comply with applicable laws and regulations and may involve incineration or other treatment or disposal in an approved chemical waste landfill. Mercury is regulated as a hazardous waste under Title 22 (22 CCR 66262.11 and 22 CCR 66273.4) Its disposal as hazardous waste is also regulated under Title 22 (22 CCR 66261.50).

Compliance with the existing regulatory framework would provide protection to construction workers and the environment, and, therefore, would also protect members of the public in the project vicinity. Thus, potential project-related hazards impacts associated with public and environmental exposure to these hazardous building materials would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Serpentinite (Naturally Occurring Asbestos)

The northeast portion of the project site is underlain by bedrock containing serpentinite, which contains naturally occurring asbestos.[210] During project excavation, naturally occurring asbestos minerals may present a human health hazard if they become airborne and are inhaled. The Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations in areas of serpentine and other ultramafic[211] rocks (contained in Title 17 of the California Code of Regulations, section 93105) protects public health and the environment by requiring the use of best available dust mitigation measures to prevent the offsite migration of asbestos-containing dust from road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas of ultramafic rock, serpentine, or naturally occurring asbestos. The air district implements the regulation in San Francisco.

As the proposed project or project variants would disturb more than 1 acre of land where asbestos-containing materials are present, project construction activities must comply with the asbestos control measure. The construction contractor would be required to prepare an asbestos dust mitigation plan specifying measures that would be taken so that no visible dust crosses the property boundary during construction. The asbestos dust mitigation plan must be submitted to and approved by the air district prior to the beginning of construction, and the construction contractor would ensure the implementation of all specified dust mitigation measures throughout the construction of the proposed project or project variant. In addition, the air district may require air monitoring for offsite migration of asbestos dust during construction activities and may change the plan on the basis of the air monitoring results. The construction contractor would also be required to comply with the work practices and personnel exposure monitoring requirements specified in Title 8 of the California Code of Regulations, section 1529.

[210] AEW Engineering, Inc., Final Phase II, Environmental Site Assessment Report, June 2018, p. 1-1.

[211] Ultramafic rocks are one type of igneous rock (formed at high temperatures well below the surface of the earth) that is rich in iron and magnesium.

In addition, San Francisco's building inspection and public works departments would administer and enforce any dust control requirements specified in the construction dust control plan, which requires contractors to implement practices, at a minimum, that will achieve the goal of "no visible dust" emissions. Compliance with the required asbestos dust mitigation plan and the construction dust control plan would ensure that project construction activities do not create a significant hazard to the public or the environment from naturally occurring asbestos. Therefore, this impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

Operation

Various chemicals in the soil (i.e., arsenic, cobalt, nickel, chromium VI, and benzo(a)pyrene and naphthalene) were detected in concentrations above their respective regulatory screening levels.[212] However, as described in the Phase II ESA report,[213] the chemicals in the soil are not expected to pose substantial adverse health impacts to site occupants and the public for the following reasons:

- Soils containing chemicals exceeding regulatory screening levels would be paved/capped, thereby minimizing direct exposure to humans.
- Detected arsenic concentrations are within published background concentrations and therefore are considered to be naturally occurring (the elevated concentration above the average concentration may be an anomaly at the site).
- Metals such as arsenic, cobalt, nickel, and chromium VI are relatively immobile and inert.

The proposed project or project variants would be constructed using materials free of hazardous materials such as asbestos, lead-based paints, and PCB-containing light ballasts. Therefore, site occupants and the public would not be exposed to hazardous building materials during operation of the proposed project or project variants.

Project operation would involve the handling of hazardous materials such as lubricants, grease, and oils associated with operation and maintenance activities of SFMTA's bus fleet and non-revenue vehicles. The hazardous waste would be handled in compliance with all applicable provisions provided in OSHA, Title 29 of the Code of Federal Regulations, section 1910, and Cal/OSHA. In addition, these activities would also be conducted in compliance with health code article 21. The proposed aboveground fuel storage tanks and chemicals would be stored indoors and in compliance with applicable laws and regulations such as the Aboveground Petroleum Storage Act, which would require secondary containment, spill prevention, and response procedures.

Therefore, operation of the proposed project or project variants would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. As such, this impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

[212] Phase II ESA, p. 4-6.
[213] Phase II ESA, pp. 5-1 - 5-2.

Impact HZ-3: The proposed project or project variants would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. (*Less than Significant*)

Several schools and daycare facilities are located within a 0.25-mile radius of the project site, including Sweet Peas Preschool (2730 17th Street), the International Child Resource Exchange Institute's Project Commotion-Las Luciernagas (2095 Harrison Street), and Brightworks School (1960 Bryant Street).[214] There are no known proposed schools in the vicinity of the project site.

Construction

Development of the project would involve demolition and construction, both of which would require the handling and transport of hazardous wastes, as described above in Impact HZ-1 and Impact HZ-2. The SFMTA and private project co-sponsor and their construction contractors would be required to comply with regulations described under Impact HZ-1 and Impact HZ-2, which would require that hazardous materials are handled safely and would not be released within 0.25 mile of existing schools.

As discussed above in Impact HZ-2, a site mitigation plan, demolition and construction dust control plan, and an asbestos dust mitigation plan would be prepared to minimize hazardous emissions during construction. Therefore, there would be limited potential for such materials to affect the nearest school, and the proposed project or project variants would have a less-than-significant impact with respect to the handling of hazardous materials within 0.25 mile of an existing school, and mitigation measures are not required. This topic will not be discussed in the EIR. Impacts related to emissions from construction vehicles will be discussed in EIR Section 3.E, Air Quality.

Operation

As discussed under Impact HZ-1, except for the batteries associated with the all-electric bus fleet, project operations would be similar to the existing transit facility use located at the property and involve the use of hazardous materials such as lubricants, grease, and oils associated with the operation and maintenance of SFMTA's bus fleet and non-revenue vehicles. The batteries would be disposed of at an appropriately licensed recycling facility following their operational life. The handling of hazardous lubricants, grease, and oils would be conducted in compliance with all applicable provisions provided in OSHA, Title 29 of the Code of Federal Regulations, section 1910 and Cal/OSHA, article 21 of the health code. The proposed aboveground fuel storage tank and chemicals would be stored indoors and in compliance with applicable laws and regulations such as the Aboveground Petroleum Storage Act, which would require secondary containment, spill prevention, and response procedures. In addition, the residential and commercial uses associated with the proposed project or project variants would involve the use of common household items in quantities too small to create a significant hazard to the public or the environment. Therefore, the proposed project or project variants would have a less-than-significant impact from the handling of hazardous

[214] San Francisco Planning Department, San Francisco Property Information Map, 2500 Mariposa Street, *http://propertymap.sfplanning.org*, and Google Earth Pro V 7.3.2 map showing location of schools and day care facilities within 0.25 mile of the project site, *https://earth.google.com/web/,* accessed March 24, 2021.

materials within 0.25 mile of an existing or proposed school, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact HZ-4: The project site is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5, but the proposed project or project variants would not create a significant hazard to the public or the environment. (*Less than Significant*)

The project site contains a Leaking Underground Storage Tank (LUST) listed as a "LUST Cleanup Site (Closed)" on the State Water Resources Control Board (water resources control board) List (Geotracker ID T0607500109).[215] The LUST was discovered and stopped in December 1990 and the water resources control board closed the remediation case in September 1991.[216] Although the project site was remediated, the Phase II ESA found concentrations of SVOCs and metals in the soil above their respective regulatory screening levels.[217] However, as described in the Phase II ESA report,[218] the chemicals in the soil are not expected to pose substantial adverse health impacts to construction workers or the surrounding public for the following reasons:

- Soils containing chemicals exceeding regulatory screening levels would be paved/capped, thereby minimizing direct exposure to humans;
- Detected arsenic concentrations are within published background concentrations and therefore are considered to be naturally occurring (the elevated concentration above the average concentration may be an anomaly at the site); and
- Metals such as arsenic, cobalt, nickel, and chromium VI are relatively immobile and inert.

In addition, the proposed project or project variants would be required to comply with health code article 22A and SCM #6, Hazardous Materials, which would require the implementation of a site mitigation plan in coordination with the department of public health and measures tailored to ensure that that if contaminated groundwater is encountered during excavation activities, appropriate remediation occurs prior to discharge to combined sewer system. The site mitigation plan would include soil, groundwater, and stormwater management protocols such as sampling and proper disposal of any hazardous waste encountered during excavation activities.

Therefore, although the project site is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5, the proposed project or project variants would not create a significant risk to the public or the environment from exposure to hazardous materials from historical site uses. The impact would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

[215] Phase II ESA, Figure 4.

[216] State Water Resources Control Board, Geotracker, *https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607500109*, accessed March 24, 2021.

[217] Phase II ESA, p. 4-6.

[218] Phase II ESA, pp. 5-1 - 5-2.

Impact HZ-5: The proposed project or project variants would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

The City has published an Emergency Response Plan, prepared by the Department of Emergency Management as part of the City's Emergency Management Program, which includes plans for hazard mitigation and disaster preparedness and recovery.[219] The Emergency Response Plan addresses the roles and responsibilities of the City during hazards-related emergency response, in particular their interaction with regional, state, and federal entities and the role of the San Francisco Emergency Operations Center and City agencies.[220] The Emergency Response Plan contains 16 "annexes" (similar to appendices) that cover a number of emergency topics.

The Transportation Annex describes the procedures for assessment, identification of temporary alternative solutions, and restoration of damage to transportation systems, facilities, and infrastructure due to an emergency incident. Project construction and operation activities would be considered to have a significant impact on the implementation or interference of the City's Emergency Response Plan or emergency evacuation planning if activities were to interfere with emergency response vehicle travel or if they were to restrict access to critical public service facilities. Project impacts related to the circulation system and its effect on emergency response and evacuation will be discussed in EIR Section 3.C, Transportation and Circulation.

The Earthquake Annex sets forth planning assumptions for a series of earthquakes of varying magnitudes on different faults, and procedures for assessment of damage and injuries, as well as operational response strategies in the event of a major earthquake. The project site is subject to very strong ground shaking.[221] During a major earthquake, glass, and in some cases building cladding, may endanger those on the streets and sidewalks. However, construction of the proposed project would be subject to the most up-to-date building and structural standards, and this would reduce the potential for damage in the event of a major earthquake. Therefore, persons visiting, living, or working in and around the project site as well as those passing by would be relatively safer than those in some older existing buildings. In addition, the proposed project or project variants are required to include provisions for emergency response for visitors and residents. These provisions would integrate and be compatible with and would not obstruct implementation of the City's Emergency Response Plan, nor interfere with emergency evacuation planning. Therefore, impacts related to interference with emergency response or evacuation plans would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

[219] San Francisco Department of Emergency Management, City and County of San Francisco Emergency Response Plan (hereinafter referred to as "Emergency Response Plan"), *http://www.sfdem.org/Modules/ShowDocument.aspx?documentid=1154*, accessed March 26, 2021.

[220] Emergency Response Plan.

[221] Association of Bay Area Governments, San Francisco County Earthquake Hazard, *http://resilience.abag.ca.gov/earthquakes/sanfrancisco/*, accessed March 26, 2021.

Cumulative Impacts

Impact C-HZ-1: The proposed project or project variants, in combination with cumulative projects in the vicinity, would not result in significant cumulative impacts related to hazards and hazardous materials. (*Less than Significant*)

Environmental impacts related to hazards and hazardous materials are site-specific. The proposed project's or project variants' impacts would not combine with nearby cumulative project impacts related to hazardous and hazardous materials. For these reasons including required compliance with the applicable local, state, and federal regulations described in Impact HZ-1 through Impact HZ-5, the proposed project or project variants would not combine with cumulative projects in the project vicinity to create a significant cumulative impact related to hazards and hazardous materials. Impacts would be less than significant, and mitigation measures are not required. This topic will not be discussed in the EIR.

E.19 Mineral Resources

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
19. MINERAL RESOURCES. Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒	☐
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒	☐

Summary of Mineral Resources Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to mineral resources (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

Impact MR-1: The proposed project or project variants would not result in the loss of availability of a known mineral resource or locally important mineral resource recovery site. (*No Impact*)

Areas of land within the City and County of San Francisco have different Mineral Resource Zone classifications, as defined by the California Division of Mines and Geology (CDMG) under the Surface Mining and Reclamation Act of

1975, based on their likelihood to contain mineral resources and the economic significance of the deposit.[222,223] The project area is within an urbanized area designated as Mineral Resource Zone-4 (MRZ-4), which signifies an area of unknown mineral resource significance, and Mineral Resource Zone-1 (MRZ-1), which signifies an area of no mineral resource significance.[224,225] Thus, the project site is not a designated area of known significant mineral deposits or a locally important mineral resource recovery site.

Based on the geotechnical report, the northeast corner of the site is underlain directly by bedrock, which dips down towards the southwest, where the site is underlain by sand and clayey sand. The project site is completely developed and located within a developed area of the City. As with most land within the City and County of San Francisco, the project site would likely not be a significant source of construction aggregate or significant mineral resources; however, some of the excavated onsite soil, if clean, is likely to be reused onsite or at other construction sites as fill material. Therefore, implementation of the proposed project or project variants would not adversely affect mineral resources, nor would it result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state. Furthermore, there are no operational mineral resource recovery sites in the project vicinity whose accessibility or operations would be affected by the construction or operation of the proposed project. Additionally, the project site does not contain any known mineral resources delineated in the general plan or any other land use plans and does not include mineral resources that are of value to the region and the residents of the state. Therefore, there would be no impact on mineral resources, and mitigation measures are not required. This topic will not be discussed in the EIR.

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[222] California Division of Mines and Geology, Special Report 146, Plate 2.41, Mineral Land Classification Map: Aggregate Resources Only San Francisco County, March 1, 1983, p. 141, *https://ia902602.us.archive.org/35/items/minerallandclass00stin/minerallandclass00stin.pdf*, accessed March 26, 2021.

[223] California Division of Mines and Geology, Mineral Land Classification: Aggregate Materials in the San Francisco – Monterey Bay Area, Special Report 146 Part I, Project Description: Mineral Land Classification for Construction Aggregate in the San Francisco – Monterey Bay Area, 1986; and Special Report 146 Part II, Classification of Aggregate Resource Areas South San Francisco Bay Production-Consumption Region, 1987, *https://archive.org/details/specialreport1461cali/mode/2up and https://ia902602.us.archive.org/35/items/minerallandclass00stin/minerallandclass00stin.pdf*, accessed May 24, 2021.

[224] California Department of Conservation, Division of Mines and Geology, Update of Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region, 1996 (hereinafter referred to as "Mineral Land Classification Update"), *http://ab900balboa.com/EIR_References/1996_cdc%20dmg_OFR_96-03_Text.pdf*, accessed March 26, 2021.

[225] Mineral Land Classification Update, Plate 1, *https://filerequest.conservation.ca.gov/?q=OFR_96-03*, accessed May 24, 2021.

E.20 Energy

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
20. ENERGY. Would the project:					
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒	☐

Summary of Energy Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to energy (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

In California, energy consumption in buildings is regulated by Title 24 of the California Code of Regulations (California Green Building Standards Code [CalGreen]). Title 24 includes standards that regulate energy consumption for the heating, cooling, ventilation, and lighting of residential and nonresidential buildings. In San Francisco, documentation demonstrating compliance with Title 24 standards is required to be submitted with a building permit application. Compliance with Title 24 standards is enforced by the department of building inspection. The proposed project or project variants would be an infill development that would include construction of a new transit facility with ground-floor commercial uses and new residential uses within the transit facility podium and atop the new transit facility. The proposed project or project variants would be required to comply with the standards of Title 24 and the requirements of the current green building code. In addition, as described above on p. 45 in initial study Section E.9, Greenhouse Gas Emissions, the proposed project or project variants would be required to be built to LEED certification at a minimum Gold Standard in compliance with Chapter 7 of the San Francisco Environment Code; thus, minimizing the amount of fuel, water, and energy used for operation of the proposed project or project variants (see EIR Chapter 2, Project Description, p. 2.46, for further details).

Impact EN-1: The proposed project or project variants would not encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner or conflict with or obstruct state or local plans for renewable energy or energy efficiency. (*Less than Significant*)

Construction

Construction of the proposed project or project variants would require increased fuel, water, and energy use for the construction vehicles and equipment, and water for construction site activities, such as dust control and equipment wash downs. Specifically, electricity would be used to operate construction equipment such as hand tools and lighting. Construction vehicles and equipment would primarily use diesel fuel, and construction workers would use gasoline, diesel, and electricity to travel to and from the project site. In sum, the energy use associated with construction of the proposed project or project variants would include:

- electricity usage associated with water consumption for dust control,
- diesel fuel consumption from on-road hauling trips and off-road construction diesel equipment,
- and gasoline consumption from on-road worker commute and vendor trips.

The amounts of fuel and energy used during construction would be typical of a public works project and would not be expected to be used in a wasteful manner. As described under Impact UT-3 in initial study Section E.13, Utilities and Service Systems, non-potable water is required to be used for construction dust control pursuant to public works code article 21. As described under in Section E.9, Greenhouse Gas Emissions, the proposed project or project variants also would be required to comply with the Resource Efficiency and Green Building Ordinance and Construction Recycled Content Ordinance, which indirectly reduces energy use by reducing the need to extract, transport, and manufacture new construction materials. Additionally, construction of the proposed project or project variants would last approximately three to four years; thus, construction-related energy use would be temporary.

As a result, construction activities would not have a measurable effect on regional energy supplies or on peak energy demand resulting in a need for additional capacity. Therefore, as a temporary activity, construction of the proposed project or project variants would not be considered inefficient or wasteful.

Operation

As analyzed under Impact UT-1 in initial study Section E.13, Utilities and Service Systems, pp. 57-60, energy use associated with operation of the proposed project or project variants would include onsite electricity usage associated with operation of the proposed building (including the transit facility and commercial and residential uses), electricity for charging the bus fleet and non-revenue vehicles, electricity for offsite water treatment and distribution, diesel fuel for three new emergency generators, and fuel from mobile sources. The new transit facility would continue to store and maintain the all-electric trolley bus fleet and non-revenue vehicles as well as a limited number of diesel- and gasoline-fueled buses and non-revenue vehicles. Although SFMTA non-revenue vehicles would likely be transitioned to be all-electric prior to reinitiating transit service from Potrero Yard in 2026, the short term

operation-related energy consumption for the new transit facility would include a limited amount of diesel and gasoline fuels associated with the operation and maintenance of SFMTA's bus fleet and non-revenue vehicles.

The project's design incorporates energy conservation design features to meet state and local goals for energy efficiency and renewable energy to reduce wasteful, inefficient, and unnecessary consumption of energy during operation. These features could include, but would not be limited to, electrical infrastructure capable of supplying electricity for electric vehicle charging at all new parking spaces and other strategies or mechanisms, such as daylight harvesting, through the use of a network of occupancy and vacancy sensors; solar photovoltaic panels on rooftops to produce onsite power; rooftop coverings to minimize heat island effects; and Title 24-compliant components for plumbing and other building systems such as HVAC.[226] The project would serve an all-electric bus fleet and any existing non-revenue service vehicles that are gasoline- or diesel-powered would transition to all electric before or soon after project completion in 2026. The proposed project's or project variant's design would also include transportation demand management measures such as bicycle parking and car-share vehicles. Furthermore, the proposed project or project variants would be located near major public transit stops, which would help minimize the amount of transportation fuel consumed.

Based on required compliance with the Title 24 conservation standards of the California Code of Regulations, operation of the proposed project or project variants would not have a measurable effect on regional energy supplies or on peak energy demand resulting in a need for additional capacity. Electric service would be provided to meet the needs of the project, as required by the California Public Utilities Commission, which obligates Pacific Gas & Electric and the SFPUC to provide service to its existing and potential customers. Pacific Gas & Electric and the SFPUC update their service projections in order to meet regional energy and water demand. Energy conservation and transportation demand management features associated with the proposed project or project variants would decrease overall energy consumption, and together with the proposed onsite solar generation facilities, decreases reliance on non-renewable energy sources, and increases reliance on renewable energy sources. The proposed project or project variants would also be consistent with San Francisco's greenhouse gas reduction strategy[227] (see Section E.9, Greenhouse Gas Emissions). Furthermore, construction energy consumption would be a temporary energy expenditure and would not occur in an inefficient or wasteful manner.

Energy demand for the proposed project or project variants would be typical for the residential and commercial components of the project. Although energy demand would be expanded for the project due to the shift to all-electric bus fleet for the transit component; all applicable state and local codes and standards concerning energy consumption in the Green Building Ordinance and Title 24 of the California Code of Regulations would be met or exceeded as part of an overall minimum LEED Gold strategy. As documented in the GHG compliance checklist,[228]

[226] Design Criteria Document, Version 2, Section 4.4 (Sustainability), Section 4.12 (Electrical), Section 5.3 (Exterior Enclosure), Section 5.8 (Plumbing), and Section 5.10 (HVAC), pp. 36-38, 46, 48-50, 71, 84, 88, 95, and 103-104.

[227] San Francisco Planning Department, 2017 Greenhouse Gas Reduction Strategy Update, *https://sfmea.sfplanning.org/GHG/GHG_Strategy_October2017.pdf*, accessed March 26, 2021.

[228] San Francisco Planning Department, Compliance Checklist Greenhouse Gas Analysis and Greenhouse Gas Analysis for Municipal Development, Compliance Checklist Table for Greenhouse Gas Analysis: Table 2. Municipal Projects, Potrero Yard Modernization Project, 2500 Mariposa Street, May 24, 2021.

the proposed project or project variants would be required to comply with applicable regulations promoting water conservation and reducing potable water use. As discussed in EIR Section 3.C, Transportation and Circulation, the project site is in a transportation analysis zone that experiences low levels of VMT per capita. Therefore, the proposed project or project variants would not encourage the use of large amounts of fuel, water, or energy, and would not use these resources in a wasteful manner.

In summary based on the reasons above, construction and operation of the proposed project or project variants would not use energy resources in an inefficient or wasteful manner. Therefore, the proposed project or project variants would have a less-than-significant impact on energy resources, and mitigation measures are not required. This topic will not be discussed in the EIR.

Impact EN-2: The proposed project or project variants would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (*No Impact*)

In 2002, California established its Renewables Portfolio Standard Program, with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent of retail sales by 2017. In November 2008, Executive Order S-14-08 was signed requiring all retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020. In 2015, Senate Bill 350 codified the requirement for the renewables portfolio standard to achieve 50 percent renewable energy by 2030, and in 2018, Senate Bill 100 requires 60 percent renewable energy by 2030 and 100 percent by 2045.[229]

San Francisco's electricity supply is 41 percent renewable, and San Francisco's goal is to meet 100 percent of its electricity demand with renewable power.[230] CleanPowerSF is the City's Community Choice Aggregation Program operated by the SFPUC, which provides renewable energy to residents and businesses. GreenFinanceSF allows commercial property owners to finance renewable energy projects, as well as energy and water efficiency projects, through a municipal bond and repay the debt via their property tax account.

As described in Section E.9, Greenhouse Gas Emissions, the proposed project or project variants were determined to be consistent with San Francisco's GHG reduction strategy, including the long-term GHG reduction goals of EO S-3-05, EO B-30-15, AB 32, SB 32 and the 2017 Clean Air Plan. Therefore, the proposed project or project variants would not conflict with these plans and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. No impact would occur, and mitigation measures are not required. This topic will not be discussed in the EIR.

[229] California Energy Commission, California Renewable Energy Overview and Programs, *https://www.energy.ca.gov/programs-and-topics/topics/renewable-energy*, accessed May 26, 2021.

[230] San Francisco Mayor's Renewable Energy Task Force Recommendations Report, September 2012, *https://sfenvironment.org/sites/default/files/fliers/files/sfe_re_renewableenergytaskforcerecommendationsreport.pdf*, accessed May 26, 2021.

Cumulative Impacts

Impact C-EN-1: The proposed project or project variants, in combination with cumulative projects, would not result in significant cumulative impacts on energy resources. (*Less than Significant*)

All development projects within San Francisco, including cumulative projects in the immediate vicinity, are required to adhere to all applicable rules and regulations in the City's Green Building Ordinance and Title 24 of the California Code of Regulations. These regulations reduce both energy use and potable water use associated with construction and operation of the proposed project or project variants and implement the latest energy conservation measures that discourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner. Furthermore, the majority of San Francisco is located within a transportation analysis zone that experiences low levels of VMT per capita compared to regional VMT levels (see EIR Section 3.C, Transportation and Circulation).

The City also plans to reduce greenhouse gas emissions to 40 percent below 1990 levels by the year 2025 and ultimately to 80 percent below 1990 levels by 2050, which would be achieved through a number of different strategies, including energy efficiency.[231] Despite a 22.5 percent growth in population and a 166 percent growth in gross domestic product (i.e., economic activity) since 1990, San Francisco's 2017 GHG emission levels were 36.6 percent below 1990 levels, thus achieving a major reduction milestone of a 25 percent reduction by 2017, per San Francisco Board of Supervisors Ordinance 81-08.[232]

For these reasons, the proposed project or project variants, combined with cumulative projects in the project vicinity and citywide, would not encourage activities that use large amounts of fuel, water, or energy or use these in a wasteful manner that would result in a significant cumulative impact on energy resources. Mitigation measures are not required. This topic will not be discussed in the EIR.

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[231] San Francisco established greenhouse gas emissions targets in section 902 of the environment code, as follows: by 2017, reduce greenhouse gas emissions by 25 percent below 1990 levels; by 2025, reduce greenhouse gas emissions by 40 percent below 1990 levels; and by 2050, reduce greenhouse gas emissions by 80 percent below 1990 levels.

[232] San Francisco Department of Environment, 2017 San Francisco Geographic Greenhouse Gas Emissions Inventory at a Glance, *https://sfenvironment.org/sites/default/files/fliers/files/sfe_cc_2017_community_inventory_report.pdf*, accessed March 26, 2021.

E.21 Agriculture and Forestry Resources

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
21. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)) or timberland (as defined by Public Resources Code Section 4526)?	☐	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or forest land to non-forest use?	☐	☐	☐	☐	☒

Summary of Agriculture and Forestry Resources Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to agriculture and forestry resources (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

The project site is located within an urbanized area and does not contain traditional or urban agricultural uses, and it is not zoned for such uses. The California Department of Conservation's Farmland Mapping and Monitoring Program identifies the project site as Urban and Built-Up Land, which is defined as "... land [that] is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation

yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes."[233] Because the project site does not contain agricultural uses and is not zoned for such uses, the proposed project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, and it would not conflict with existing zoning for agricultural use or a Williamson Act contract. It would not involve any changes to the environment that could result in the conversion of farmland. Therefore, initial study checklist topics E.21(a), E.21(b), and E.21(e) are not applicable to the proposed project or project variants.

Additionally, the project site does not contain forest land or timberland and is not zoned for such uses. Forest land is defined as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits" (CEQA section 12220(g)). Timberland is defined as "privately owned land, or land acquired for state forest purposes, which is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, and which is capable of growing an average annual volume of wood fiber of at least 15 cubic feet per acre" (Government Code section 51104). The proposed project or project variants would not convert any forest land or timberland to non-forest use and would not conflict with existing zoning for forest land or timberland use, nor would they involve any changes to the environment that could result in the conversion of forest land or timberland. Therefore, initial study checklist topics E.21(c) and E.21(d) are not applicable to the proposed project or project variants. This topic will not be discussed in the EIR.

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[233] California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, San Francisco Bay Area Important Farmland 2012, September 2015, *ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/regional/2012/bay_area_2012_fmmp_base.pdf*, accessed March 26, 2021.

E.22 Wildfire

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
22. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plans?	☐	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☐	☒
d) Expose people or structures to significant risks including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☐	☒

Summary of Wildfire Comments Received in Response to the Notice of Preparation of an EIR and Notice of Public Scoping Meeting

Issues identified in public comments on the NOP related to the proposed project's or project variants' physical environmental impacts were considered in preparing this analysis. There were no comments on the NOP related to wildfire (see EIR Chapter 1, Introduction, pp. 1.3-1.5).

Project-Specific Impacts

California Department of Forestry and Fire Protection (CAL FIRE) is an emergency response and resource protection department that protects California's people, property, and natural resources from wildfires.[234] CAL FIRE has a legal responsibility to provide fire protection and emergency services on all State Responsibility Area lands. State responsibility area lands are designated based on an evaluation of an area's fuel loading,[235] slope, critical weather, and other relevant factors. CAL FIRE identifies three types of fire threat based on degree of fire risk: Moderate, High, and Very High. CAL FIRE also maps Very High Hazard Severity Maps for Local Responsibility Areas, which are areas the local government has responsibility for wildland fire protection.[236]

[234] CAL FIRE, What is Cal FIRE, *https://www.fire.ca.gov/media/4925/whatiscalfire.pdf*, accessed March 26, 2021.

[235] Fuel loading refers to the amount of flammable vegetation within a given area.

[236] CAL FIRE, Wildland Hazard and Building Codes, *https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/*, accessed March 26, 2021.

The City and County of San Francisco does not contain any state responsibility area lands or lands classified in any fire hazard severity zones.[237] Therefore, the project site is not located within or near mapped state responsibility area lands or on lands classified as Very High Fire Hazard Severity. The topic of wildfire is not applicable to the proposed project or project variants., and mitigation measures are not required. This topic will not be discussed in the EIR.

F. Public Notice and Comment

On August 19, 2020, the planning department mailed a Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting to property owners and tenants within 300 feet of the project site; the Mission, Potrero, South of Market and citywide neighborhood group lists; and other potentially interested parties. In addition, the planning department held a public scoping meeting on September 2, 2020, to receive input on the scope of the environmental review for this project.

During the NOP scoping period, a total of eight comments were provided: one speaker provided oral comments at the virtual public scoping meeting and seven comment letters and emails were submitted to the planning department. Comments received expressed concern about the preservation of the historic building and the decision to construct a new facility rather than rehabilitate the existing one; parking, noise, wind, and shadow impacts; impacts on the neighborhood character; impacts on Franklin Square; impacts on birds and other wildlife; impacts on cyclists and the potential increase in bicycle-related traffic accidents; the context and feasibility of the project given budgetary constraints and capital deferrals resulting from circumstances surrounding COVID-19; effects of increased pedestrian traffic on adjacent properties; upgrades to transportation infrastructure; requirements of Assembly Bill 52 and Senate Bill 18; and California Native American Heritage Commission standard recommendations for cultural resources research, surveys, and reporting.

Overall, concerns and issues raised by the public in response to the notice of preparation of an EIR and at the NOP scoping meeting were taken into consideration and addressed in this initial study and the EIR to which this initial study is attached, as appropriate. See EIR Chapter 1, Introduction, for additional detail on the public noticing and comments. The notice of preparation of an EIR is included as EIR Appendix A.

G. Mitigation Measures

The following mitigation measures have been identified in this initial study to reduce potentially significant impacts resulting from the proposed project or project variants to less-than-significant levels. Other potentially significant impacts are fully analyzed in EIR Chapter 3, Environmental Setting and Impacts.

[237] CAL FIRE, Fire and Resource Assessment Program, Fire Hazard Severity Zone Viewer, *https://egis.fire.ca.gov/FHSZ/*, accessed March 26, 2021.

Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation and/or Interpretive Program

During ground-disturbing activities that encounter archeological resources, if the Environmental Review Officer (ERO) determines that a significant archeological resource is present, and if in consultation with the affiliated Native American tribal representatives, the ERO determines that the resource constitutes a tribal cultural resource (TCR) and that the resource could be adversely affected by the proposed project, the proposed project shall be redesigned so as to avoid any adverse effect on the significant tribal cultural resource, if feasible.

If the ERO, in consultation with the project sponsor, determines that preservation-in-place of the TCR would be both feasible and effective, then the archeological consultant shall prepare an archeological resource preservation plan (ARPP). Implementation of the approved ARPP by the archeological consultant shall be required when feasible.

If the ERO, in consultation with the affiliated Native American tribal representatives and the project sponsor, determines that preservation-in-place of the TCR is not a sufficient or feasible option, then the project sponsor shall implement an interpretive program of the TCR in consultation with affiliated Native American tribal representatives. An interpretive plan produced in consultation with affiliated Native American tribal representatives, at a minimum, and approved by the ERO, would be required to guide the interpretive program. The plan shall identify proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, artifacts displays and interpretation, and educational panels or other informational displays.

Mitigation Measure M-GE-6a: Inadvertent Discovery of Paleontological Resources

Worker Awareness Training - Prior to commencing construction, and ongoing throughout ground disturbing activities (e.g., excavation, utility installation, the project sponsor team and/or their designee shall ensure that all project construction workers are trained on the contents of the Paleontological Resources Alert Sheet, as provided by the Planning Department. The Paleontological Resources Alert Sheet shall be prominently displayed at the construction site during ground disturbing activities for reference regarding potential paleontological resources.

In addition, the project sponsor team shall inform the contractor and construction personnel of the immediate stop work procedures and other procedures to be followed if bones or other potential fossils are unearthed at the project site. Should new workers that will be involved in ground disturbing construction activities begin employment after the initial training has occurred, the construction supervisor shall ensure that they receive the worker awareness training as described above.

The project sponsor team shall complete the standard form/affidavit confirming the timing of the worker awareness training to the Environmental Review Officer (ERO). The affidavit shall confirm the project's location, the date of training, the location of the informational handout display, and the number of participants. The affidavit shall be transmitted to the ERO within five (5) business days of conducting the training.

Paleontological Resource Discoveries - In the event of the discovery of an unanticipated paleontological resource during project construction, ground disturbing activities shall temporarily be halted within 25 feet of the find until the discovery is examined by a qualified paleontologist as recommended by the Society of Vertebrate Paleontology standards (SVP 2010) and Best Practices in Mitigation Paleontology (Murphey et al. 2019). Work within the sensitive area shall resume only when deemed appropriate by the qualified paleontologist in consultation with the ERO.

The qualified paleontologist shall determine: 1) if the discovery is scientifically significant; 2) the necessity for involving other responsible or resource agencies and stakeholders, if required or determined applicable; and 3) methods for resource recovery. If a paleontological resource assessment results in a determination that the

resource is not scientifically important, this conclusion shall be documented in a Paleontological Evaluation Letter to demonstrate compliance with applicable statutory requirements (e.g., Federal Antiquities Act of 1906, CEQA Guidelines Section 15064.5, California Public Resources Code Chapter 17, Section 5097.5, Paleontological Resources Preservation Act 2009). The Paleontological Evaluation Letter shall be submitted to the ERO for review within 30 days of the discovery.

If the qualified paleontologist determines that a paleontological resource is of scientific importance, and there are no feasible measures to avoid disturbing this paleontological resource, the qualified paleontologist shall prepare a Paleontological Mitigation Program. The mitigation program shall include measures to fully document and recover the resource of scientific importance. The qualified paleontologist shall submit the mitigation program to the ERO for review and approval within 10 business days of the discovery. Upon approval by the ERO, ground disturbing activities in the project area shall resume and be monitored as determined by the qualified paleontologist for the duration of such activities.

The mitigation program shall include: 1) procedures for construction monitoring at the project site; 2) fossil preparation and identification procedures; 3) curation of paleontological resources of scientific importance into an appropriate repository; and 4) preparation of a Paleontological Resources Report (report or paleontology report) at the conclusion of ground disturbing activities. The report shall include dates of field work, results of monitoring, fossil identifications to the lowest possible taxonomic level, analysis of the fossil collection, a discussion of the scientific significance of the fossil collection, conclusions, locality forms, an itemized list of specimens, and a repository receipt from the curation facility. The project sponsor team shall be responsible for the preparation and implementation of the mitigation program, in addition to any costs necessary to prepare and identify collected fossils, and for any curation fees charged by the paleontological repository. The paleontology report shall be submitted to the ERO for review within 30 business days from conclusion of ground disturbing activities, or as negotiated following consultation with the ERO.

Mitigation Measure M-GE-6b: Preconstruction Paleontological Evaluation and Monitoring Plan during Construction

The project sponsor team shall engage a qualified paleontologist to develop a site-specific monitoring plan prior to commencing soil-disturbing activities at the project site. The Preconstruction Paleontological Monitoring Plan would determine project construction activities requiring paleontological monitoring based on those may affect sediments with moderate sensitivity for paleontological resources. Prior to issuance of any demolition permit, the project sponsor team shall submit the Preconstruction Paleontological Monitoring Plan to the ERO for approval.

At a minimum, the plan shall include:

1. Project Description
2. Regulatory Environment – outline applicable federal, state and local regulations
3. Summary of Sensitivity Classification(s)
4. Research Methods, including but not limited to:

    4.a. Field studies conducted by the approved paleontologist to check for fossils at the surface and assess the exposed sediments.

    4.b. Literature Review to include an examination of geologic maps and a review of relevant geological and paleontological literature to determine the nature of geologic units in the project area.

    4.c. Locality Search to include outreach to the University of California Museum of Paleontology in Berkeley.

5. Results: to include a summary of literature review and finding of potential site sensitivity for paleontological resources; and depth of potential resources if known.

6. Recommendations for any additional measures that could be necessary to avoid or reduce any adverse impacts to recorded and/or inadvertently discovered paleontological resources of scientific importance. Such measures could include:

    6.a. Avoidance: If a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation.

    6.b. Fossil Recovery: If isolated small, medium- or large-sized fossils are discovered during field surveys or construction monitoring, and they are determined to be scientifically significant, they should be recovered. Fossil recovery may involve collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending upon the size and complexity of the fossil discovery.

    6.c. Monitoring: Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other types of construction excavations for the presence of fossils, and the fossil recovery and documentation of these fossils before they are destroyed by further ground disturbing actions. Standard monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (moderate, high, and very high potential); while spot-check monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (moderate or unknown potential).

    6.d. Data recovery and reporting: Fossil and associated data discovered during soils disturbing activities should be treated according to professional paleontological standards and documented in a data recovery report. The plan should define the scope of the data recovery report.

The consultant shall document the monitoring conducted according to the monitoring plan and any data recovery completed for significant paleontological resource finds discovered, if any. Plans and reports prepared by the consultant shall be considered draft reports subject to revision until final approval by the ERO. The final monitoring report and any data recovery report shall be submitted to the ERO prior to the certificate of occupancy.

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H. Determination

On the basis of this Initial Study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an environmental impact report is required.

☒ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

DATE	Lisa Gibson, Environmental Review Officer for Rich Hillis, Director of Planning

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APPENDIX A

Water Supply Assessment
Potrero Yard Modernization Project
2500 Mariposa Street

PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **20-0216**

WHEREAS, Under the California Environmental Quality Act (CEQA) and State of California Water Code (Section 10910(g)(1)), the San Francisco Public Utilities Commission (SFPUC) is required to prepare and approve a Water Supply Assessment (WSA) for the cumulative water demands presented by the proposed 2500 Mariposa Street/SFMTA Potrero Bus Yard Project, which would result in replacement of the existing Potrero Yard Trolley Coach Facility with a new structure to accommodate bus parking and circulation, SFMTA maintenance, operation, and administrative uses, and a mix of commercial and residential uses, including 575 residential units; and

WHEREAS, The 2500 Mariposa Street/SFMTA Potrero Bus Yard Project is required to comply with the City's Non-potable Water Ordinance, Article 12C of the San Francisco Health Code, and as a result, the Project will offset its potable water use through the use of alternate water sources; and

WHEREAS, A WSA is an informational document that assesses the adequacy of water supplies to serve a proposed project and is required to be prepared as part of the CEQA environmental review process; and

WHEREAS, The water demand associated with the 2500 Mariposa Street/SFMTA Potrero Bus Yard Project is encompassed within the 2015 Urban Water Manament Plan water demand projections; and

WHEREAS, Approval of a WSA as an informational document is not considered an approval action as defined in Section 15378 of the CEQA Guidelines; and

WHEREAS, A WSA must be approved at a public meeting by the governing body of the public water supplier that would serve the proposed project; and

WHEREAS, On December 12, 2018, the State Water Resources Control Board adopted an amendment to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (i.e., Bay-Delta Plan Amendment), which, if implemented in the future, would affect the Regional Water System supply and the SFPUC's ability to meet the projected demands of existing and future retail customers, including the proposed project; and

WHEREAS, Multiple lawsuits are pending challenging the Bay-Delta Plan Amendment, and the City is a party to one of those suits; and

WHEREAS, In accordance with the State Water Resources Control Board's instruction, on March 1, 2019, the SFPUC, in partnership with other key stakeholders, submitted a proposed "voluntary agreement" (March 1st Proposed Voluntary Agreement) for the State's consideration as a substitute or replacement of the Bay-Delta Plan Amendment; and

WHEREAS, On March 26, 2019 by Resolution No. 19-0057, this Commission endorsed the SFPUC's continued participation in the voluntary agreement negotiation process and stated its intent that the terms of any final voluntary agreement would improve the health of the fisheries and maintain the reliability of its water supply including maintenance of its level of service (LOS) goal of no more than 20% system-wide rationing; and

WHEREAS, Because implementation of the Bay-Delta Plan Amendment or an alternative Voluntary Agreement is uncertain at this time, the SFPUC staff prepared the attached WSA for the proposed 2500 Mariposa Street/SFMTA Potrero Bus Yard Project, analyzing water supply and demand under three scenarios: (1) No implementation of the Bay-Delta Plan Amendment or the March 1st Proposed Voluntary Agreement ("Scenario 1"), (2) Implementation of the March 1st Proposed Voluntary Agreement ("Scenario 2"), and (3) Implementation of the Bay-Delta Plan Amendment ("Scenario 3"); and

WHEREAS, The WSA concludes that the SFPUC's total projected water supplies through 2040 will (1) meet the demands of the proposed project in normal years under all three scenarios, (2) meet the demands of the proposed project in dry years without rationing beyond the SFPUC's LOS goal of 20% system-wide rationing under Scenario 1, (3) meet the demands of the proposed project in dry years but require rationing closer to the LOS goal under Scenario 2, and (4) not reliably meet the demands of the proposed project without rationing at a level greater than that required to achieve the LOS goal under Scenario 3; now, therefore, be it

RESOLVED, This Commission approves the attached Water Supply Assessment for the proposed 2500 Mariposa Street/SFMTA Potrero Bus Yard Project pursuant to the State of California Water Code Section 10910(g).

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of October 27, 2020.

Donna Hood

Secretary, Public Utilities Commission

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

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September 25, 2020

TO: Commissioner Ann Moller Caen, President
Commissioner Anson Moran
Commissioner Sophie Maxwell
Commissioner Tim Paulson

THROUGH: Harlan L. Kelly, Jr., General Manager

FROM: Steven R. Ritchie, Assistant General Manager, Water

RE: Water Supply Assessment for the 2500 Mariposa Street/SFMTA Potrero Bus Yard Project

---

1.0 Summary

1.1 Introduction

Under the Water Supply Assessment law (Sections 10910 through 10915 of the California Water Code), urban water suppliers like the San Francisco Public Utilities Commission (SFPUC) must furnish a Water Supply Assessment (WSA) to the city or county that has jurisdiction to approve the environmental documentation for certain qualifying projects (as defined in Water Code Section 10912 (a)) subject to the California Environmental Quality Act (CEQA). The WSA process typically relies on information contained in a water supplier's Urban Water Management Plan (UWMP), and involves answering specific questions related to the estimated water demand of the proposed project. This memo serves as the WSA for the proposed 2500 Mariposa/SFMTA Potrero Bus Yard Project ("proposed project"), for use in the preparation of an environmental impact report by the San Francisco Planning Department (case no. 2019-021884ENV, San Francisco Planning Department).

1.1.1 2015 Urban Water Management Plan

The SFPUC's most current UWMP is the UWMP update for 2015, which the Commission adopted in June 2016 (Resolution No. 16-0118). The water demand projections in the UWMP incorporated 2012 Land Use Allocation (LUA 2012) housing and employment growth projections from the San Francisco Planning Department. The water demand projections are presented in five-year increments through 2040, meeting Water Code requirements. Growth associated with the proposed project was encompassed within the LUA 2012, and water demand associated with the proposed project was encompassed within the 2015 UWMP water demand projections. In other words, **the proposed project has already been already accounted for in SFPUC's water supply planning**.

The WSA for a qualifying project within the SFPUC's retail service area[1] may use information from the UWMP. Therefore, ***the 2015 UWMP is incorporated via***

[1] SFPUC's "retail service area" refers to water customers inside the City and County of San Francisco, as well as select areas outside of the City.

references throughout this WSA shown in bold, italicized text. The UWMP may be accessed at www.sfwater.org/uwmp.

1.1.2 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 40% of the "unimpaired flow"[2] on the three tributaries from February through June in every year type, whether wet, normal, dry, or critically dry.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in the 2015 UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. The 2015 UWMP already assumes limited rationing may be needed in multiple dry years to address an anticipated supply shortage by 2040, but implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years and to a greater degree to address supply shortages not accounted for in the 2015 UWMP.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for several reasons. First, under the Clean Water Act, the United States Environmental Protection Agency (U.S. EPA) must approve the water quality standards identified in the Plan Amendment within 90 days from the date the approval request is received. It is uncertain whether the U.S. EPA will approve or disapprove the water quality standards. Furthermore, the determination could result in litigation.

Second, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal court, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. That litigation is in the early stage and there have been no dispositive court rulings as of this date.

Third, the Bay-Delta Plan Amendment is not self-implementing and does not allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, the 401 certification process in the Federal Energy Regulatory Commission's relicensing proceeding for Don Pedro Dam. The license amendment process is currently expected to be completed in the 2022-23 timeframe. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Fourth, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to

[2] Unimpaired flow represents the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds. Bay-Delta Plan Amendment, Introduction, p.1-8.

incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3] The negotiations for a voluntary agreement have made significant progress since an initial framework was presented to the SWRCB on December 12, 2018. The package submitted on March 1, 2019 is the product of renewed discussions since Governor Newsom took office. In a written progress report to the Voluntary Agreement Plenary Participants dated July 1, 2019, California Secretary for Environmental Protection Jared Blumenfeld and California Secretary for Natural Resources Wade Crowfoot stated that the collective State agencies (i.e., State Team) should be able "to determine the adequacy" of the various proposed voluntary agreements, including the proposed Tuolumne Voluntary Agreement, by October 15, 2019. The report further states that if the State Team decides to recommend the Voluntary Agreements to the SWRCB, then (1) scientific peer review of the Voluntary Agreements would be completed by the spring of 2020, and (2) a draft CEQA document would be released for public comment in the summer of 2020, with a finalized CEQA document completed the following year.

For all these reasons, whether and when the Bay-Delta Plan Amendment will be implemented, and how those amendments if implemented will affect the SFPUC's water supply is currently uncertain and possibly speculative. Given this uncertainty, this WSA analyzes water supply and demand through 2040 under three scenarios: (1) No implementation of the Bay-Delta Plan Amendment or the March 1st Proposed Voluntary Agreement ("Scenario 1"), (2) Implementation of the March 1st Proposed Voluntary Agreement ("Scenario 2"), and (3) Implementation of the Bay-Delta Plan Amendment ("Scenario 3").

1.1.3 Basis for Requiring a WSA for the Proposed Project

The proposed project has not been the subject of a previous WSA, nor has it been part of a larger project for which a WSA was completed.

The proposed project qualifies for preparation of a WSA under Water Code Section 10912(a) because it is a mixed-use development that includes more than 500 dwelling units. The proposed project is characterized further in Section 1.2.

1.1.4 Conclusion of this WSA

This WSA concludes that under Scenarios 1, 2, and 3, the SFPUC's total projected water supplies would meet the demands of the proposed project and cumulative retail water demands through 2040 in normal years. Based on historic records of hydrology and reservoir inflow from 1920 to 2017, current delivery and flow obligations, and fully-implemented infrastructure under the 2018 Phased Water System Improvement Program (WSIP) Variant, normal or wet years occurred 85 out of 97 years. This translates into roughly 9 normal or wet years out of every 10 years. Conversely, system-wide rationing is required roughly 1 out of every 10 years. This frequency is expected to increase as climate change intensifies.

Scenario 1 - No Implementation of the Bay-Delta Plan Amendment or the Voluntary Agreement: Under Scenario 1, SFPUC's total projected water supplies would meet the projected demands of the retail service area in normal years. During

[3] California Natural Resources Agency. "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds." http://resources.ca.gov/voluntary-agreements/. Accessed April 8, 2019.

dry years, there would be a shortfall of 3.6-6.1 million gallons per day (mgd), or 5-7%. The SFPUC could manage this relatively small shortfall by prohibiting certain discretionary outdoor water uses and/or calling for voluntary rationing among all retail customers pursuant to its Retail Water Shortage Allocation Plan (***Appendix L of the UWMP***).

Scenario 2 - Implementation of the Voluntary Agreement: The March 1st Proposed Voluntary Agreement has yet to be accepted by SWRCB as an alternative to the Bay-Delta Plan Amendment and thus the shortages that would occur with its implementation are not known with certainty. An analysis of water supply impacts comparable to the one provided in this WSA for Scenarios 1 and 3 is not available for Scenario 2. However, the flow releases under the Voluntary Agreement, unlike the Bay-Delta Plan Amendment, are not based on an unimpaired flow approach but on a combination of flow and non-flow measures that are designed to benefit fisheries at a lower water cost, particularly during multiple dry years when less flow is required, preserving more of the SFPUC's stored water supply from the Tuolumne River. The resulting RWS supply shortfalls during dry years under the Voluntary Agreement would be less than those under the Bay-Delta Plan Amendment, and therefore would require rationing of a lesser degree and closer in alignment to the SFPUC's adopted level of service (LOS) goal for the RWS of rationing of no more than 20% system-wide during dry years than that which would occur under Scenario 3. Indeed, in Resolution No. 19-0057, the Commission stated its intention that any final voluntary agreement "would allow the SFPUC to maintain the (1) Water Supply Level of Service Goal and Objectives and (2) Sustainability Level of Service Goal and Objectives adopted in Commission Resolution No. 08-0200." Under Scenario 2, if SFPUC's March 1st Proposed Voluntary Agreement were accepted by the SWRCB as an alternative to the Bay-Delta Plan Amendment, SFPUC would still face a shortfall in single dry and multiple dry years, thus requiring rationing across the retail service area, but of a much smaller magnitude. Rationing under Scenario 2, with implementation of the Voluntary Agreement, would be to a lesser degree than that under Scenario 3, with implementation of the Bay-Delta Plan Amendment.

Scenario 3 - Implementation of the Bay-Delta Plan Amendment: Under Scenario 3, during single dry and multiple dry years starting as soon as the year 2022, the estimated year of implementation of the Bay-Delta Plan Amendment, the SFPUC's total projected water supplies cannot meet the demands of the retail service area, including those of the proposed project, without gradually increasing higher levels of water rationing of up to 50% through 2040 across the retail service area. For the proposed project specifically, the SFPUC may impose a lower level of rationing that takes into account the installation of water-efficient plumbing fixtures and non-potable water systems associated with new construction.

The relatively small volume of water demand generated by the proposed project itself would not exacerbate the projected shortfalls resulting from implementation of the Bay-Delta Plan Amendment. Regardless of whether the proposed project is constructed, with implementation of the Bay-Delta Plan Amendment, the SFPUC's existing and planned water supplies will not meet the water demands of its retail service area in dry years without greater rationing than previously projected in the 2015 UWMP.

Refer to Section 4.0, Conclusion, for a tabulated comparison of projected retail water supplies and demands under Scenarios 1 and 3, the resulting shortfalls, and the implications of rationing to the proposed project.

1.2 Proposed Project Description

The project sponsor, the San Francisco Municipal Transportation Agency (SFMTA), proposes to replace the Potrero Yard Trolley Coach Facility at 2500 Mariposa Street (Potrero Yard). The proposed project would accommodate the expansion of the SFMTA's transit vehicle fleet in a new replacement structure that would include space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses.

The new approximately 1,300,000 gross-square-foot (GSF) structure would occupy the 4.4-acre (192,000 square feet) site and rise to heights ranging from 75 to 150 feet. The new structure would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the proposed project as part of a joint development program between SFMTA and a private project cosponsor. The joint development program would include a ground-floor commercial use (approximately 33,000 GSF) and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit facility. Most of the residential development would be atop the replacement transit facility on the 7th to 13th floors. The proposed project includes 544,000 square feet for 575 residential units.

Of the 192,000 square foot (SF) project site, the building footprint is 189,860 SF, with a 5-foot wide planting strip along the 17th Street frontage (2,140 GSF). The building footprint includes 91,000 GSF of rooftop courtyard and 98,860 GSF of standard rooftop.

The SFMTA estimates that construction of the proposed project would take three to four years to complete, with construction beginning in 2023 and building occupancy by the end of 2026.

For additional details on the proposed project, see Attachment B.

2.0 Water Supply

This section reviews San Francisco's existing and planned water supplies.

2.1 Regional Water System

See ***Section 3.1 of the UWMP*** for descriptions of the RWS and ***Section 6.1 of the UWMP*** for water rights held by City and County of San Francisco and the SFPUC Water System Improvement Program (WSIP).

2.2 Existing Retail Supplies

Retail water supplies from the RWS are described in ***Section 6.1 of the UWMP***.

Local groundwater supplies, including the Westside Groundwater Basin, are described in ***Section 6.2.1 of the UWMP***.

Local recycled water supplies, including the Harding Park Recycled Water Project and Pacifica Recycled Water Project, are described in ***Section 6.2.1 of the UWMP***.

2.3 Planned Retail Water Supply Sources

The San Francisco Groundwater Supply Project is described in ***Section 6.2.2 of the UWMP***. Since adoption of the UWMP, four wells have been completed and the start-up phase of the project has begun. Starting in April 2017, small amounts of groundwater have been blended with RWS supplies for drinking water. Two remaining wells are under construction as part of the next phase of the project.

The proposed Westside and Eastside Recycled Water Projects, as well as non-potable water supplies associated with onsite water systems implemented in compliance with San Francisco's Non-potable Water Ordinance (Health Code Chapter 12C), are also described in ***Section 6.2.2 of the UWMP***.

2.4 Summary of Current and Future Retail Water Supplies

A breakdown of water supply sources for meeting SFPUC retail water demand through 2040 in normal years is provided in ***Section 6.2.5 of the UWMP***. For dry years, see the next section.

Based on historic records of hydrology and reservoir inflow from 1920 to 2017, current delivery and flow obligations, and fully-implemented infrastructure under the 2018 Phased Water System Improvement Program (WSIP) Variant, normal or wet years occurred 85 out of 97 years. This translates into roughly 9 normal or wet years out of every 10 years. Conversely, system-wide rationing is required roughly 1 out of every 10 years. This frequency is expected to increase as climate change intensifies.

2.5 Dry-Year Water Supplies

A description of dry-year supplies developed under WSIP is provided in ***Section 7.2 of the UWMP***. Other water supply reliability projects and efforts that are currently underway or completed are described in ***Section 7.4 of the UWMP***. Since adoption of the UWMP, the following milestones have occurred:

- Calaveras Dam Replacement Project – Construction of the new dam was completed in September 2018, and the reservoir resumed fill during the winter season of 2019/2020.
- Regional Groundwater Storage and Recovery Project – Construction of this project is still underway. Phase 1 of the project, consisting of installation of 13 production wells, will be completed in 2019. Since May/June 2016, the project has been in a storage phase through periodic deliveries of RWS surface water in lieu of groundwater pumping by Daly City, San Bruno, and the California Water Service Company.

2.6 Additional Water Supplies

In light of the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, the SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience. Developing these additional supplies would reduce water supply shortfalls and reduce rationing associated with such shortfalls. In addition to the Daly City Recycled Water Expansion project[4], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. The SFPUC is also considering developing related policies and ordinances, such as funding for innovative water supply and efficiency technologies and requiring potable water offsets for new developments. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 or more years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. Capital projects would be funded through rates from both Wholesale and Retail Customers based on mutual agreement, as the additional supplies would benefit all customers of the RWS, unless otherwise noted. State and federal grants and other financing opportunities would also be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

[4] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

1. **Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply, 3 mgd)**

   Project Description: The SFPUC and North San Mateo County Sanitation District (NSMCSD, or Daly City) have been exploring ways to increase the recycled water treatment capacity in Daly City to serve additional customers and decrease irrigation water withdrawals from the Westside Groundwater Basin, both in San Francisco and further south of Daly City. The majority of the irrigation demand met by groundwater withdrawals, approximately 2 mgd, serves cemeteries in Colma. An initial feasibility study completed in 2010 identified the capital requirements that would be needed to produce additional capacity at the existing treatment plant location. The study demonstrated that a new tertiary treatment facility would be required onsite to produce additional capacity of up to 3.4 mgd. Currently, flows that exceed the capacity of the existing treatment plant are discharged into the Pacific Ocean. With this project, some of that discharge may be treated and used for irrigation. New facilities would include a treatment facility, pump station, distribution pipelines, and storage.

   Estimated Costs and Financing: The capital cost is estimated to be $85 million, which is budgeted for in the SFPUC's 10-year capital planning horizon. The annual operations and maintenance (O&M) cost is estimated to be $3 million. This project may present regional benefits that would result in cost-sharing with Wholesale Customers because the replacement of groundwater used for irrigation with recycled water will result in a greater volume of groundwater storage that can be used in dry years as part of the SFPUC's existing Groundwater Storage and Recovery project, approved by the SFPUC in 2014 in Resolution no. 14-0127.

   Permits and Approvals: Daly City adopted a Final Initial Study/Mitigated Negative Declaration (IS/MND) and Mitigation Monitoring and Reporting Program (MMRP) for the proposed project in September 2017. The SFPUC has not yet approved its participation in the project. Other permits and/or approvals that may be needed for this project include: BART, CAL/OSHA, San Francisco Bay RWQCB, and encroachment permits from Caltrans, Daly City, South San Francisco, SFPUC, San Mateo County, and Colma to construct distribution and storage facilities. Institutional agreements between the project partners for project construction and operation, as well as with the customers whose supplies will change from groundwater to recycled water, will also need to be developed.

   Estimated Acquisition: Construction may occur as soon as 2023 with operation beginning in 2027.

2. **Alameda County Water District Transfer Partnership** (Regional, Normal- and Dry-Year Supply, 5 mgd)

   Project Description: Water would be acquired from Contra Costa Water District (CCWD) for delivery to Alameda County Water District (ACWD) through the South Bay Aqueduct utilizing a planned expansion of the Los Vaqueros Reservoir.

   Estimated Costs and Financing: The capital cost is estimated to be $50-150 million, with an annual O&M cost of $2.5 million.

   Permits and Approvals: Planning and environmental review of the Los Vaqueros Reservoir Expansion is underway by CCWD, and has several objectives beyond water deliveries to the SFPUC. CCWD has identified over 15 permits, approvals and consultations that will be necessary such as Dredge and Fill, National Pollutant Discharge Elimination System (NPDES), Streambed Alteration, and Encroachment permits. These permits and approvals will be obtained by CCWD and/or its contractor. To enable a water supply transfer between ACWD and the SFPUC, water right modifications may be necessary and if additional infrastructure is

needed, additional permits will be required. As this project is in the conceptual stage, permitting details have not yet been identified.

Estimated Acquisition: Construction may occur as soon as 2028 with operation beginning in 2032.

3. **Brackish Water Desalination in Contra Costa County** (Regional, Normal- and Dry-Year Supply, 9+ mgd)

Project Description: The Bay Area Brackish Water Treatment (Regional Desalination) Project is a partnership between CCWD, East Bay Municipal Utility District (EBMUD), SFPUC, Santa Clara Valley Water District (SCVWD) and Zone 7 to turn brackish water into a reliable, drought-proof drinking water supply, delivering a total of up to 10-20 mgd in drought and non-drought years (i.e., dry and normal years), throughout the region. A new brackish water treatment plant would be constructed in East Contra Costa and tie into the existing CCWD system for delivery through Los Vaqueros Reservoir and the South Bay Aqueduct, or delivery via a connection with EBMUD.

The SFPUC would rely on existing infrastructure and institutional agreements to receive water transfers from partner agencies. For planning and cost estimation purposes, it was assumed that the SFPUC's share of the regional water supply would be 9 mgd in all year types; however, if additional capacity is available, the SFPUC may secure additional water supply, based on negotiations with partner agencies.

Estimated Costs and Financing: The capital cost is estimated to be $200-800 million, with an annual O&M cost of $12-20 million.

Permits and Approvals: To proceed, this concept would require extensive institutional agreements, permitting, and environmental review. Construction of a new desalination plant will require construction and operating permits such as NPDES, Dredge and Fill, consultations with federal and state agencies, and others. In addition, water rights will need to be secured and/or modified. In California, permitting and regulatory approvals of desalination projects has typically taken 10-18 years. In addition, institutional agreements among partner agencies will be needed.

Estimated Acquisition: Construction may occur as soon as 2032 and be phased so that 5-9 mgd would be available to the region by 2035 and a total of 5-11 mgd would be available after 2040.

4. **ACWD-USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply, 5 mgd)

Project Description: This may be an indirect or direct potable reuse project that would inject highly-treated water from Union Sanitary District (USD) for groundwater recharge, then recover the water through the ACWD Brackish Groundwater Desalination Plant. How the water is transferred to the SFPUC remains to be determined.

Estimated Costs and Financing: The capital cost is estimated to be $200-400 million, with an annual O&M cost of $2.5 million.

Permits and Approvals: An initial assessment will be underway in 2019, which will identify potential project scenarios. Permitting and approvals for a project will depend on its design and nature, which have not yet been identified.

Estimated Acquisition: Construction may occur as soon as 2038 with operation beginning in 2045.

5. **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply, 6+ mgd)

   Project Description: This is an indirect potable reuse project that would blend wastewater from Silicon Valley Clean Water and possibly San Mateo into Crystal Springs Reservoir and treat the blended water at Harry Tracy Water Treatment Plant for potable reuse.

   Estimated Costs and Financing: The capital cost is estimated to be $400-700 million, with an annual O&M cost of $18-25 million.

   Permits and Approvals: Construction and operating permits would be required for this project. They would likely include NPDES, Encroachment, consultations with state and federal agencies, and others. Surface water augmentation is regulated by the SWRCB, and consultations and public hearings would be required.

   Estimated Acquisition: Construction may occur as soon as 2034 and be phased so that 3-5 mgd would be available to the region by 2035 and a total of 3-7 mgd would be available after 2040.

6. **Eastside Purified Water** (Retail, Normal- and Dry-Year Supply, 5 mgd)

   Project Description: A purified water plant would be constructed at the Southeast Treatment Plant to blend wastewater with Regional Water System supplies for potable use.

   Estimated Costs and Financing: The capital cost is estimated to be $220-400 million, with an annual O&M cost of $5-10 million.

   Permits and Approvals: There is currently no regulatory framework in place to enable direct potable reuse. In California, no regulations are anticipated before 2025, but it is anticipated that extensive consultation will be required with the SWRCB. In addition, construction and operating permits and approvals will be required, as identified.

   Estimated Acquisition: Construction may occur as soon as 2025 with operation beginning in 2030.

7. **San Francisco Eastside Satellite Recycled Water Facility** (Retail, Normal- and Dry-Year Supply, < 1 mgd)

   Project Description: A centralized recycled water treatment facility would be constructed on the eastern side of San Francisco, along with pipelines and a storage reservoir, to meet demands not addressed by the Non-potable Water Ordinance and Auxiliary Water Supply System (AWSS).

   Estimated Costs and Financing: The capital cost is estimated to be $200 million, with an annual O&M cost of $2.5 million.

   Permits and Approvals: In addition to construction-related permits and approvals, this project would require a permit from the Regional Water Quality Control Board under its General Order for water reuse. Discharges from the recycled water treatment plant to the San Francisco Bay would also require NPDES permitting by the Regional Water Quality Control Board.

   Estimated Acquisition: Construction may occur as soon as 2032 with operation beginning in 2037.

8. **Additional Storage Capacity in Los Vaqueros Reservoir from Expansion** (Regional)

   Project Description: Expansion of storage capacity in Los Vaqueros is to allow the ACWD Transfer Partnership and Brackish Water Desalination in Contra Costa County to be optimized.

   Estimated Costs and Financing: The capital cost is estimated to be $20-50 million. SFPUC's portion of the project yield and cost share are not yet known. The annual O&M cost is yet to be estimated.

   Permits and Approvals: Planning and review of the Los Vaqueros Reservoir Expansion is underway by CCWD, and has several objectives beyond water deliveries to the SFPUC. CCWD has identified over 15 permits, approvals and consultations that will be necessary such as Dredge and Fill, NPDES, Streambed Alteration, and Encroachment permits. These permits and approvals will be obtained by CCWD and/or its contractor. To enable a water supply transfer between ACWD and the SFPUC, water rights modifications may be necessary and if additional infrastructure is needed, additional permits will be required. As this project is in the conceptual stage, permitting details have not yet been identified.

   Estimated Acquisition: Construction may occur as soon as 2021 with operation beginning in 2027.

9. **Calaveras Reservoir Expansion** (Regional)

   Project Description: Calaveras Reservoir would be expanded to create 289,000 AF additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

   Estimated Costs and Financing: The costs of this project is yet to be determined.

   Permits and Approvals: Similar to Los Vaqueros Reservoir Expansion, this project would require numerous permits, approvals and consultations, such as Dredge and Fill, NPDES, Streambed Alteration, Encroachment, possible water right modifications, etc. These permits and approvals will be obtained by SFPUC and/or its contractor. As this project is in the conceptual stage, permitting details have not yet been identified.

   Estimated Acquisition: Construction may occur as soon as the early 2040s with operation beginning around 2050.

Even if all the capital projects above are implemented, the total amount of water and storage yielded would not be enough to make up for the dry year shortfall that may result from implementation of the Bay-Delta Plan Amendment as adopted, and would occur years after such shortfalls begin. Thus, the SFPUC continues to proactively explore opportunities for reuse and innovation, such as the following policies and ordinances:

- **Evaluation of Recycled Water Throughout Service Area** (Regional and Retail)

  Wastewater treatment plants throughout the SFPUC service area would be surveyed to identify potential non-potable, indirect potable, and direct potable projects.

- **Innovative Technology Project Funding** (Retail)

  SFPUC would award grants for innovative demonstration projects that would increase water efficiency and availability (e.g., fog catchers, heat exchangers in non-potable water systems, rainwater for potable use, breweries treating process water for reuse).

- **New Development Potable Offset Ordinance** (Retail)

  The Board of Supervisors could adopt an ordinance requiring certain large development projects, to offset the water demand impacts above historical water consumption averages for the corresponding parcel(s). Developments could be required to achieve a certain offset of potable demands.

3.0 Water Demand

This section reviews the climatic and demographic factors that may affect San Francisco's water use, projected retail water demands, and the demand associated with the proposed project.

3.1 Climate

San Francisco has a Mediterranean climate. Summers are cool and winters are mild with infrequent rainfall. Temperatures in the San Francisco area average 57 degrees Fahrenheit annually, ranging from the mid-40s in winter to the upper 60s in late summer. Strong onshore flow of wind in summer keeps the air cool, generating fog through September. The warmest temperatures generally occur in September and October. Rainfall in the San Francisco area averages about 22 inches per year and is generally confined to the "wet" season from late October to early May. Except for occasional light drizzles from thick marine stratus clouds, summers are nearly completely dry. A summary of the temperature and rainfall data for the City of San Francisco is included in Table 1.

Table 1: San Francisco Climate Summary

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Monthly Rainfall (inches)
January	58.0	45.7	4.36
February	60.3	47.3	4.41
March	61.4	48.1	2.98
April	62.3	49.1	1.38
May	63.2	50.9	0.68
June	64.8	52.7	0.18
July	65.6	54.3	0.02
August	66.6	55.3	0.06
September	68.1	55.0	0.19
October	67.8	53.3	1.04
November	61.2	48.1	2.85
December	58.3	45.9	4.33
Annual Average	**63.3**	**50.6**	**22.45**

Source: Western Regional Climate Center (www.wrcc.dri.edu), 1981-2010 data from two San Francisco monitoring stations (Mission Dolores/SF#047772 and Richmond/SF#047767).

3.2 Proposed Project Water Demand

The project sponsor's consultants provided a memo describing the methods and assumptions used to estimate the water demand of the proposed project, along with the resulting demand (Attachment B).

Because the proposed project must comply with San Francisco's Non-potable Water Ordinance (Article 12C of the San Francisco Health Code), estimates for both potable and non-potable demands were submitted as part of the WSA request. The Non-potable Water Ordinance requires new commercial, mixed-use, and multi-family residential development projects with 250,000 square feet or more of gross floor area to install and operate an onsite non-potable water system. Such projects must meet their toilet and urinal flushing and irrigation demands through the collection, treatment, and use of available graywater, rainwater, and foundation drainage. While not required, projects may use treated blackwater or stormwater if desired. Furthermore, projects may choose to apply non-potable water to other non-potable water uses, such as cooling tower blowdown and industrial processes, but are not required to do so under the ordinance. As indicated in the water demand memo provided on behalf of the project sponsor in Attachment B, the proposed project would exceed the requirements of the Non-potable Water Ordinance by using graywater, rainwater, and bus washdown water to meeting toilet and urinal flushing, irrigation, cooling tower make-up water, and bus washdown demands.

Both potable and non-potable demands for the project were estimated using the SFPUC's Non-potable Water Calculator and supplemented with additional calculations for cooling tower makeup water. The SFPUC reviewed the memo to ensure that the methodology is appropriate for the types of proposed water uses, the assumptions are valid and thoroughly documented along with verifiable data sources, and a professional standard of care was used. The SFPUC concluded that the demand estimates provided on behalf of the project sponsor are reasonable. Water demand associated with the proposed project over the 20-year planning horizon is shown in the following Table 2.

The non-potable demand estimates in Table 2 are based on building uses anticipated at the time the WSA was requested, i.e., during the planning and environmental review stage of the proposed project. It is understood that these estimates will likely change as the proposed project's design progresses, and information submitted for the WSA request is not part of the proposed project's compliance with the Non-potable Water Ordinance. City review and approval of a proposed onsite water system must be performed separately through the Non-potable Water Program. However, the intent of providing a breakdown of potable and non-potable demand estimates in this WSA is to demonstrate that the proposed project will incorporate water reuse per City requirements and the proposed project's sustainability goals, if any. As noted earlier, the total demand of the proposed project, regardless of non-potable use, is already encompassed in the 2015 UWMP water demand projections. Furthermore, total demand represents the most conservative estimate and accounts for back-up potable supplies that must be provided by the SFPUC in the event that non-potable supplies serving the proposed project are unavailable.

Table 2: Water Demand Based on Project Phasing

Demand of Proposed Project (mgd)	2020	2025	2030	2035	2040
Potable Demand	--	0	0.048	0.048	0.048
Non-potable Demand	--	0	0.028	0.028	0.028
Total Demand	--	0	0.076	0.076	0.076
Potential Potable Water Savings as Percentage of Total Demand	--	--	37%	37%	37%

mgd = million gallons per day

Notes:
Total demand conservatively assumes that all demands are met with potable supplies. For the estimated portion of demands that could be met with non-potable supplies, refer to Attachment B.

Of the non-potable demands shown in this table, 0.018 mgd (65%) reflect use for cooling tower make-up water and bus washdown water, which are not required to be met with non-potable water under San Francisco's Non-Potable Water Ordinance.

The San Francisco Planning Department has determined that the proposed project is encompassed within the projections presented in LUA 2012 as indicated in the letter from the Planning Department to the SFPUC (Attachment A). Therefore, the demand of the proposed project is also encompassed within the San Francisco retail water demands that are presented in ***Section 4.1 of the UWMP***, which considers retail water demand based on the LUA 2012 projections. The following Table 3 shows the demand of the proposed project relative to total retail demand.

Table 3: Proposed Project Demand Relative to Total Retail Demand

	2020	2025	2030	2035	2040
Total Retail Demand (mgd)[1]	72.1	79.0	82.3	85.9	89.9
Potable Demand of Proposed Project (mgd)	--	0	0.048	0.048	0.048
Potable Demand of Proposed Project as Percentage of Total Retail Demand	--	--	0.06%	0.06%	0.05%
Total Demand of Proposed Project (mgd)	--	0	0.076	0.076	0.076
Total Demand of Proposed Project as Percentage of Total Retail Demand[2]	--	--	0.09%	0.09%	0.08%

Notes:
1. Retail water demands per ***Table 4-1 of the UWMP***, except for the 2020 demand projection, which was re-projected to take into account the lower demands being experienced due to the recent drought and the lag in occupancy of built units.
2. The proposed project is accounted for in the LUA 2012 projections, and subsequently, total demands associated with the proposed project are accounted for in the 2015 UWMP retail water demand projections.

4.0 Conclusion

4.1 Comparison of Projected Supply and Demand

4.1.1 Scenario 1: No Implementation of the Bay-Delta Plan Amendment or the Voluntary Agreement

Table 4 below is adapted from ***Section 7.5 of the UWMP*** (Table 7-4) and compares the SFPUC's retail water supplies and demands through 2040 during normal year, single dry-, and multiple dry-year periods under Scenario 1.

Local supplies (i.e., supplies not from the RWS) correspond to those in ***Table 6-7 of the UWMP***. Procedures for determining RWS supply availability per the SFPUC's WSAP, applicable to all three scenarios, are described in ***Section 8.3 of the UWMP***.

The projections shown in Table 4 differ from those in the 2015 UWMP due to two reasons. First, the 2009 Water Supply Agreement between SFPUC and its Wholesale Customers was recently amended and approved by the Commission on December 11, 2018 by Resolution No. 18-0212. Table 4 incorporates the minimum level of 5% rationing during supply shortages as required by the amendment, and therefore, the resulting shortfalls are greater than those previously projected in the 2015 UWMP.

Second, the projections in Table 4 differ from those in the 2015 UWMP because Table 4 reflects SFPUC's full 8.5-year design drought sequence instead of the minimum 3-year sequence required to be provided in the 2015 UWMP. Under legislation adopted in 2018 (S.B. 606) future UWMPs will be required to project water supply availability during a minimum of 5 years of continuous drought (Water Code section 10631(b)(1)).

As explained previously in Section 3.2, water demands associated with the proposed project are already captured in the retail demand projections presented in the UWMP. The proposed project is expected to represent up to 0.09% of the total retail water demand. Total retail demands correspond to those in ***Table 4-1 of the UWMP***, and reflect both passive and active conservation, as well as water loss.

As shown in Table 4, under Scenario 1 without implementation of the Bay-Delta Plan Amendment, existing and planned supplies would meet all projected RWS demands in all years except for an approximately 3.6-6.1 mgd, or 5-7%, shortfall during dry years through the year 2040. This relatively small shortfall is primarily due to implementation of the amended 2009 Water Supply Agreement. To manage a small shortfall such as this, the SFPUC may prohibit certain discretionary outdoor water uses and/or call for voluntary rationing by its retail customers pursuant to its Retail Water Shortage Allocation Plan (***Appendix L of the UWMP***). The required level of rationing is well below the SFPUC's RWS LOS goal of limiting rationing to no more than 20% on a system-wide basis (i.e., an average throughout the RWS).

Table 4: Projected Supply and Demand Comparison Under Scenario 1
(No Implementation of the Bay-Delta Plan Amendment or the Voluntary Agreement) (mgd)

		Normal Year	Single Dry Year[1]	Multiple Dry Years							
				Year 1[1]	Year 2[2]	Year 3[2]	Year 4[2]	Year 5[2]	Year 6[2]	Year 7[3]	Year 8[3]
2020	Total Retail Demand[4]	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1
	Total Retail Supply[5]	72.1	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5
	Shortfall	0.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2025	Total Retail Demand[4]	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0
	Total Retail Supply[5]	79.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
	Shortfall	0.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2030	Total Retail Demand[4]	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3
	Total Retail Supply[5]	82.3	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
	Shortfall	0.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2035	Total Retail Demand[4]	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
	Total Retail Supply[5]	85.9	81.6	81.6	81.6	81.6	81.6	81.6	81.6	79.5	79.5
	Shortfall	0.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	6.4	6.4
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	7.4%	7.4%
2040	Total Retail Demand[4]	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9
	Total Retail Supply[5]	89.9	85.4	85.4	84.4	84.4	84.4	84.4	84.4	83.8	83.8
	Shortfall	0.0	4.5	4.5	5.5	5.5	5.5	5.5	5.5	6.1	6.1
	Shortfall as % of Demand	0.0%	5.0%	5.0%	6.2%	6.2%	6.2%	6.2%	6.2%	6.8%	6.8%

Notes:
1. During a single dry year and multiple dry year 1 (year 2 of SFPUC's design drought sequence), the retail allocation under the WSAP is 36.0% of available RWS supply, or 85.9 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply can be delivered. RWS supply is capped at this amount.
2. During multiple dry years 2-6 (years 3-7 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 79.5 mgd.
3. During multiple dry years 7 and 8 (years 8 and 8.5 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 74.5 mgd.
4. Total retail demands correspond to those in ***Table 4-1 of the UWMP***, except for the 2020 demand projection, which was re-projected to take into account the lower demands being experienced due to the recent drought and the lag in occupancy of built units.
5. Local supplies (i.e., supplies not from the RWS, including groundwater, recycled water, and non-potable water) correspond to those in ***Table 6-7 of the UWMP***, with an additional 5% reduction in retail water use (incorporated as a reduction in total retail supply) per the amended Water Supply Agreement. Local supplies are assumed to be used before RWS supplies to meet retail demand.

4.1.2 Scenario 2: Implementation of the Voluntary Agreement

As stated earlier, the March 1st Proposed Voluntary Agreement has yet to be accepted by SWRCB as an alternative to the Bay-Delta Plan Amendment and thus the shortages that would occur with its implementation are not known with certainty. However, given that the objectives of the Voluntary Agreement are to provide fishery improvements while protecting water supply through flow and non-flow measures, the RWS supply shortfalls under the Voluntary Agreement would be less than those under the Bay-Delta Plan Amendment, and therefore would require rationing of a lesser degree than that which would occur under Scenario 3. The degree of rationing would also more closely align with the SFPUC's RWS LOS goal of limiting rationing to no more than 20% on a system-wide basis in drought years. This goal was adopted in 2008 by the Commission (Resolution No. 08-0200).

4.1.3 Scenario 3: Implementation of the Bay-Delta Plan Amendment

Table 5 below provides projected supplies and demands under Scenario 3. The RWS is projected to experience significant shortfalls in single dry and multiple dry years starting as soon as 2022 and through 2040, regardless of whether the proposed project is constructed. These significant shortfalls are a result of implementation of the Bay-Delta Plan Amendment and not attributed to the incremental retail demand associated with the proposed project. Shortfalls would range from about 12 to 45 mgd, corresponding to rationing in the retail service area ranging 16-50%, over the next 20 years.

If additional water supplies were not acquired before the Bay-Delta Plan Amendment were implemented, the SFPUC would impose customer rationing to help balance water supply deficits during dry years.

Given the severity of the reduction in RWS supply with implementation of the Bay-Delta Plan Amendment, existing and planned dry-year supplies would not be enough to meet projected retail demands without rationing above the SFPUC's RWS LOS goal of limiting rationing to 20% on a system-wide basis for all dry years starting as soon as 2022. Although the WSAP does not address implications to retail supply during system-wide shortages above 20%, the WSAP indicates that if system-wide shortage greater than 20% were to occur, RWS supply would be allocated between retail and Wholesale Customers per the rules corresponding to a 16-20% system-wide reduction, subject to consultation and negotiation between the SFPUC and its Wholesale Customers to modify the allocation rules. The allocation rules corresponding to the 16-20% system-wide reduction are reflected in Table 5 above for Scenario 3. These allocation rules result in shortfalls of 16-50% across the retail service area as a whole under Scenario 3.

Table 5: Projected Supply and Demand Comparison Under Scenario 3 (Implementation of the Bay-Delta Plan Amendment) (mgd)

		Normal Year	Single Dry Year[1]	Multiple Dry Years							
				Year 1[1]	Year 2[2]	Year 3[2]	Year 4[2]	Year 5[2]	Year 6[2]	Year 7[3]	Year 8[3]
2020	Total Retail Demand[4]	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1
	Total Retail Supply[5]	72.1	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5
	Shortfall	0.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2025	Total Retail Demand[4]	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0
	Total Retail Supply[5]	79.0	66.7	66.7	52.8	52.8	52.8	52.8	52.8	42.9	42.9
	Shortfall	0.0	12.3	12.3	26.2	26.2	26.2	26.2	26.2	36.1	36.1
	Shortfall as % of Demand	0.0%	15.6%	15.6%	33.2%	33.2%	33.2%	33.2%	33.2%	45.7%	45.7%
2030	Total Retail Demand[4]	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3
	Total Retail Supply[5]	82.3	68.7	68.7	54.8	54.8	54.8	54.8	54.8	44.9	44.9
	Shortfall	0.0	13.6	13.6	27.5	27.5	27.5	27.5	27.5	37.4	37.4
	Shortfall as % of Demand	0.0%	16.5%	16.5%	33.4%	33.4%	33.4%	33.4%	33.4%	45.4%	45.4%
2035	Total Retail Demand[4]	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
	Total Retail Supply[5]	85.9	68.8	68.8	54.9	54.9	54.9	54.9	54.9	45.0	45.0
	Shortfall	0.0	17.1	17.1	31.0	31.0	31.0	31.0	31.0	40.9	40.9
	Shortfall as % of Demand	0.0%	19.9%	19.9%	36.1%	36.1%	36.1%	36.1%	36.1%	47.6%	47.6%
2040	Total Retail Demand[4]	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9
	Total Retail Supply[5]	89.9	68.9	68.9	55.0	55.0	55.0	55.0	55.0	45.1	45.1
	Shortfall	0.0	21.0	21.0	34.9	34.9	34.9	34.9	34.9	44.8	44.8
	Shortfall as % of Demand	0.0%	23.4%	23.4%	38.8%	38.8%	38.8%	38.8%	38.8%	49.8%	49.8%

Notes:
1. During a single dry year and multiple dry year 1 (year 2 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 59.6 mgd.
2. During multiple dry years 2-6 (years 3-7 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 45.7 mgd.
3. During multiple dry years 7 and 8 (years 8 and 8.5 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 35.8 mgd.
4. Total retail demands correspond to those in ***Table 4-1 of the UWMP***, except for the 2020 demand projection, which was re-projected to take into account the lower demands being experienced due to the recent drought and the lag in occupancy of built units.
5. Local supplies (i.e., supplies not from the RWS, including groundwater, recycled water, and non-potable water) correspond to those in ***Table 6-7 of the UWMP***. Local supplies are assumed to be used before RWS supplies to meet retail demand.

4.2 Rationing Implications to the Proposed Project

While the levels of rationing described above apply to the retail service area as a whole (i.e., 5-7% under Scenario 1, 16-50% under Scenario 3), the SFPUC may allocate different levels of rationing to individual retail customers based on customer type (e.g., dedicated irrigation, single family residential, multi-family residential, commercial, etc.) to achieve the required level of retail system-wide rationing. Allocation methods and processes that have been considered in the past and may be used in future droughts are described in the SFPUC's current Retail Water Shortage Allocation Plan (***Appendix L of the UWMP***). However, additional allocation methods that reflect existing drought-related rules and regulations adopted by the Commission during the recent drought (2015-2016 Drought Program adopted by Resolution 15-0119) are more pertinent to current and foreseeable development and water use in San Francisco and may be included in the SFPUC's update to its Retail Water Shortage Allocation Plan. The updated Retail Water Shortage Allocation Plan will be brought forward to the Commission along with the 2020 Urban Water Management Plan for consideration and adoption through a public hearing process in 2021. It is anticipated that the updated Retail Water Shortage Allocation Plan would include a tiered allocation approach that imposes lower levels of rationing on customers who use less water than similar customers in the same customer class, and would require higher levels of rationing by customers who use more water. This approach aligns with the SWRCB's statewide emergency conservation mandate imposed during the recent drought, in which urban water suppliers who used less water were subject to lower reductions than those who used more water. Imposing lower rationing requirements on customers who already conserve more water is also consistent with the implementation of prior rationing programs based on past water use, in which more efficient customers were allocated more water through an appeal process administered by the General Manager. Staff expects that under a future Retail Water Shortage Allocation Plan adopted by the Commission, the allocation method or combination of methods that would be applied during water shortages caused by drought would similarly be subject to the discretion of the General Manager.

The SFPUC anticipates that, as a worst-case scenario under Scenario 3, a mixed-use residential customer such as the proposed project could be subject to up to 38% rationing during a severe drought.[5] In accordance with the Retail Water Shortage Allocation Plan, the level of rationing that would be imposed on the proposed project would be determined at the time of a drought or other water shortage and cannot be established with certainty prior to the shortage event. However, newly-constructed buildings, such as the proposed project, have water-efficient fixtures and non-potable water systems that comply with the latest regulations. Thus, if these buildings can demonstrate below-average water use, they would likely be subject to a lower level of rationing than other retail customers that meet or exceed the average water use for the same customer class.

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[5] This worst-case rationing level for San Francisco multi-family residential was estimated for the purpose of preparing comments on behalf of the City and County of San Francisco on the SWRCB's Draft Substitute Environmental Document in Support of Potential Changes to the Bay-Delta Plan, dated March 16, 2017. See comment letter Attachment 1, Appendix 3, Page 5, Table 3. The comment letter and attachments are available on the SWRCB website: https://www.waterboards.ca.gov/public_notices/comments/2016_baydelta_plan_amendment/docs/dennis_herrera.pdf. The rationing estimates prepared for the comment letter apply to the first 6 years of the SFPUC's 8.5-year design drought as they reflect the 1987-92 drought. For the last 2.5 years of the design drought, a corresponding worst-case rationing level for San Francisco mixed-use residential customers was not estimated. While the level of rationing imposed on the retail system will be higher for the outer years of the design drought compared to the first 6 years, it is reasonable to assume that mixed-use residential customers would not have to conserve more than 38%.

4.3 Findings

Regarding the availability of water supplies to serve the proposed project beginning in 2026, the SFPUC finds, based on the entire record before it, as follows:

- During normal years, the SFPUC's total projected water supplies will meet the projected demands of its retail customers, including those of the proposed project, existing customers, and foreseeable future development under Scenario 1, Scenario 2, and Scenario 3.
- During single dry years and multiple dry years under Scenario 1—No implementation of the Bay-Delta Plan Amendment or the March 1st Proposed Voluntary Agreement—the SFPUC can meet the projected demands of its retail customers, including those of the proposed project, existing customers, and foreseeable future development without the need for rationing beyond the LOS goal of 20% system-wide rationing. Based on past hydrology, statistically speaking dry years occur roughly once out of every 10 years.
- During single dry years and multiple dry years under Scenario 2—Implementation of the March 1st Proposed Voluntary Agreement—the SFPUC would still face a shortfall in single dry and multiple dry years, thus requiring rationing, but to a lesser degree and in closer alignment to the LOS goal of no more than 20% system-wide rationing compared to that which would occur under Scenario 3.
- During single dry years and multiple dry years under Scenario 3—Implementation of the Bay-Delta Plan Amendment—the SFPUC cannot reliably meet the projected demands of its retail customers, including the proposed project, existing customers, and foreseeable future development, without rationing at a level greater than that required to achieve the LOS goal of a maximum of 20% system-wide average rationing starting as soon as 2022. The SFPUC estimates it would impose up to 50% rationing across the retail service area and up to 38% rationing for mixed-use residential customers such as the proposed project.

Approval of this WSA by the Commission is not equivalent to approval of the development project for which the WSA is prepared. A WSA is an informational document required to be prepared for use in the City's environmental review of a project under CEQA. It assesses the adequacy of water supplies to serve the proposed project and cumulative demand.

Furthermore, this WSA is not a "will serve" letter and does not verify the adequacy of existing distribution system capacity to serve the proposed project. A "will serve" letter and/or hydraulic analysis must be requested separately from the SFPUC City Distribution Division to verify hydraulic capacity.

While this WSA contains information provided by or on behalf of the project sponsor regarding the proposed project's plans for onsite water reuse and demand estimates using the SFPUC's Non-potable Water Calculator, any information submitted to the SFPUC for preparation of this WSA does not fulfill the requirements of the Non-potable Water Ordinance. City review and approval of a proposed onsite water system must be performed separately through the Non-potable Water Program.

If there are any questions or concerns, please contact Steve Ritchie at (415) 934-5736 or SRitchie@sfwater.org.

Attachments: Attachment A, Communications from San Francisco Planning Department
Attachment B, 2500 Mariposa/SFMTA Potrero Bus Yard Project Demand Memo

Attachment A –

Communications from San Francisco Planning Department

SAN FRANCISCO
PLANNING DEPARTMENT

MEMO

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DATE: June 13, 2013

TO: SF Planning EP Planners & SFPUC Planners

FROM: Scott T. Edmondson, AICP; Aksel Olsen

RE: Project Types Represented in the Land Use Allocation

This Memorandum explains the Planning Department's Land Use Allocation (LUA) and the types of projects included in the LUA. The 2012 LUA is the most recent update and uses the Association of Bay Area Governments' (ABAG) May 2012 Jobs-Housing Connection Scenario. As this memorandum explains, the Planning Department expects that the LUA will encompass the vast majority of development proposals that project sponsors will present to the Planning Department. This memorandum also identifies possible unusual circumstances under which EP Planners and the SF PUC Planners may want to consult further with the Planning Department's Information and Analysis Group to determine whether a project is encompassed within the LUA.

ABAG's Projections of San Francisco's Economic Growth and the LUA

The LUA takes ABAG's 30-year projections of citywide household and job growth and allocates them to smaller geographic units, in this case, the traffic analysis zones of the SF Transportation Authority's Countywide Transportation Model. Thus, the LUA does not project growth but simply allocates ABAG's growth projections to subarea locations within the city. The current 2012 LUA uses ABAG's Jobs-Housing Connection Scenario projections for San Francisco and covers the period from 2010 to 2040; these projections were released in May 2012 and are represented in five-year increments.

ABAG derives its demographic and economic growth projections from assumptions about long-term demographic and economic growth.[1] ABAG maintains its own set of regional models and develops each forecast with its in-house experts and private economic consultants.[2] The forecasting is informed by the best information and assumptions available through federal and State agencies, such as the State Department of Finance, and private sources. However, ABAG develops its forecast based on local knowledge from over 50 years of forecasting and develops the forecast to reflect local conditions in contrast to more general forecasting assumptions of State or federal sources. ABAG's estimate of total citywide growth for the 30-year period is expected to best represent actual growth at the end of the 30-year period. However, projected growth for any portion of the projection period, such as growth in a one-year or a five-year period, would be expected to vary from actual growth in such periods. Within the 30-year growth projection period, higher than average growth periods could be followed by lower than average growth periods such that growth over the period would ultimately equal the projected 30-year

total. All projection methodologies make assumptions based on the best available information at the time. To minimize the effects of imprecision intrinsic to any projections methodology when used in for planning decisions, ABAG follows professional best practices and updates its projections every two years. Accordingly, the Planning Department updates its LUA every two years. The planning practice of frequently updating projections and plans allows the incorporation of new information over time to provide for the most up-to-date projections.

The SFPUC updates its Urban Water Management Plan (UWMP) every five years. The UWMP typically relies on LUA projections or similar information. But, because the LUA is updated every two years, the SFPUC may want to review the LUA issued within SFPUC's 5-year UWMP cycle; and if it varies in a significant way from the SFPUC's projections used in its UWMP, discuss with Planning whether it should make any changes in its own water supply needs assessment during an UWMP cycle.

Types of Projects Included in the LUA

The LUA translates ABAG's projected household and job growth into total expected development in San Francisco over a 30-year period. The LUA translates ABAG's household growth into residential housing units and ABAG's job growth into commercial space.[3] Thus, the LUA projections of housing units and commercial space include all project types expected from San Francisco growth, such as housing, office, retail, production-distribution-repair (PDR), visitor, and cultural-institutional-educational (CIE). The LUA does not exclude any project type or potential growth. As such, the LUA and the ABAG economic projections upon which it is based contain the best estimates available of reasonably foreseeable growth and development in San Francisco over a 30-year period.

Unusual Circumstances

The LUA can be considered to include all reasonably expected growth and development and it is frequently updated to correct for expected variations. Nevertheless, there are possible unusual circumstances under which the EP Planners or SFPUC Planners may want to request further Planning Department consultation with the Information and Analysis Group to determine if a particular project falls within the LUA. ABAG's projections and the Department's LUA take into account urban economic trends and based on that information capture all reasonably foreseeable growth in San Francisco. Limited capital and aggregate demand of any urban economy constrains growth. However, occasionally the reality or perception may arise that a project lies outside the normal growth constraints of the San Francisco economy for some reason, and therefore lies outside ABAG's projection's and the Department's current spatial allocation in its LUA.

One can envision the rare case of a project arising outside the City's economy (demand and capital) from an organization not located in San Francisco using nonprofit foundation funds or private donations to construct a large institutional project in San Francisco, such as a major hospital, a university, or an office complex. These projects would represent spending and demand beyond that normally active in the San Francisco economy, and therefore represent net additions to projected growth beyond that captured by ABAG's projections and reflected in the Department's LUA. Indicative characteristics of such projects

would include those with non-local sponsors, of large size, and for an institutional land use. Alternatively, very large project proposals from local project sponsors active in the SF economy involving a large site, land assembly, a planned unit development (PUDs), master plans, or area plan and rezoning proposals may warrant individual assessment for a range of reasons even though they are likely captured in ABAG's projections and the LUA. Such projects would be similar to recent projects such as Hunters Point/Candlestick, Park Merced, Treasure Island, Pier 70 Master Plan, Eastern Neighborhoods, or the Transit Center District Plan.

The bi-annual update of ABAG's projections and the LUA would be able to capture development associated with such projects. However, should such a project be proposed between updates, the EP Planners and SFPUC could treat its appearance as sufficient cause to request the Planning Department's assistance in determining whether to consider the project outside the latest LUA projections.

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[1] Please see ABAG's summary of its research and forecasting on its website: http://www.abag.ca.gov/planning/research/index.html

[2] ABAG describes its current Jobs-Housing Scenario policy-based forecast here: http://onebayarea.org/pdf/JHCS/May_2012_Jobs_Housing_Connection_Strategy_Appendices_Low_Res.pdf.

[3] The LUA citywide totals only differ slightly, up to within one percent of ABAG totals (+/-). The difference is produced by LUA's complex method of translating ABAG projections into development (residential units and commercial space) and allocating total citywide growth to subarea locations. The minor difference between the LUA and ABAG citywide totals is real in absolute terms, but not in the sense that they are different projections. The one percent difference does not constitute a difference of projections. ABAG and MTC consider variation of one percent in citywide totals, plus or minus, as sufficiently representing ABAG's projections for consistency with the MTC regional projections and modeling purposes (congestion management, etc.). Even if a few versions of the LUA must be done to make minor subarea spatial allocation corrections, as long as the LUA's citywide totals are within one percent of ABAG's projections, and ABAG's projections have not changed, the LUA citywide totals have not effectively changed either. Any of those LUA versions' citywide totals fully represent the same unchanged ABAG projection totals.

Attachment B –

2500 Mariposa Street/SFMTA Potrero Bus Yard Project Demand Memo

SAN FRANCISCO
PLANNING DEPARTMENT

MEMO

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DATE: September 17, 2020

TO: Sarah Triolo, SFPUC

FROM: David Young, Environmental Planning

CC: Laura Lynch, Environmental Planning

RE: 2500 Mariposa Street/SFMTA Potrero Bus Yard - Water Supply Assessment Request (Planning Department Case No. 2019-021884ENV)

The purpose of this memorandum is to request that the San Francisco Public Utilities Commission (SFPUC) prepare a Water Supply Assessment (WSA) for the proposed 2500 Mariposa Street/SFMTA Potrero Bus mixed-use project in compliance with CEQA Guidelines Section 15155 and Sections 10910 through 10915 of the California Water Code.

As indicated in the attached memorandum from the project sponsor, the San Francisco Municipal Transportation Agency (SFMTA), proposes to replace the Potrero Yard Trolley Coach Facility at 2500 Mariposa Street (Potrero Yard). The project proposes a mix of commercial and residential uses in the remainder of the project as part of a joint development program between SFMTA and a private project co-sponsor. The proposed project would accommodate the expansion of the SFMTA's transit vehicle fleet in a new replacement structure that would include space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses. The new approximately 1,300,000 gross-square-foot (GSF) structure would occupy the 4.4-acre (192,000 square feet) site and rise to heights ranging from 75 to 150 feet. Table 1 provides the proposed project's overall land uses in GSF.

Table1: Proposed Project Constructed Gross Areas by Land Use

	GSF
Bus Service and Storage	186,000
Administration and Common Areas	52,000
Residential (575 units)	544,000
Commercial	33,000
Ramps and Drives	485,000
TOTAL	**1,300,000**
Notes: GSF= gross square feet.	

The project sponsor has provided project information intended to meet the requirements outlined in the SFPUC guidance memo dated September 6, 2016. A summary of the project description, average daily water demands, and supporting tables prepared by the project sponsor's consultant (based on the SFPUC Non-Potable Water Calculator Version 6), are attached.

Should you have questions or need additional information from the Planning Department or the project sponsor, please contact me at 628-652-7494 or david.l.young@sfgov.org.

Subject:	**SFMTA Potrero Yard Modernization Project (Case No. 2019-021884ENV)** **Water Supply Assessment Analysis**
Prepared By:	Beth Goldstein, PE
Reviewed By:	David Young, Environmental Planning
Date:	September 16, 2020
HCE Reference:	190002

1 Introduction

Under sections 10910 through 10915 of the California Water Code, urban water suppliers like the SFPUC must prepare water supply assessments for certain large "water demand" projects, as defined in CEQA Guidelines section 15155. Water supply assessments rely on information contained in the water supplier's urban water management plan and on the estimated water demand of both the proposed project and projected growth within the relevant portion of the water supplier's service area. Because up to 575 residential units would be developed, the Project meets the definition of a water demand project under CEQA Guidelines section 15155 (a)(1)(g) and requires a water supply assessment (CEQA Guidelines section 15155 (b)).

This memorandum provides the necessary information for the preparation of a Water Supply Assessment by the Planning Department and the SFPUC. This water demand estimate for the Project was developed according to the guidance provided by the San Francisco Public Utilities Commission as outlined in their memo to project proponents dated September 6, 2016.[1]

2 Proposed Project

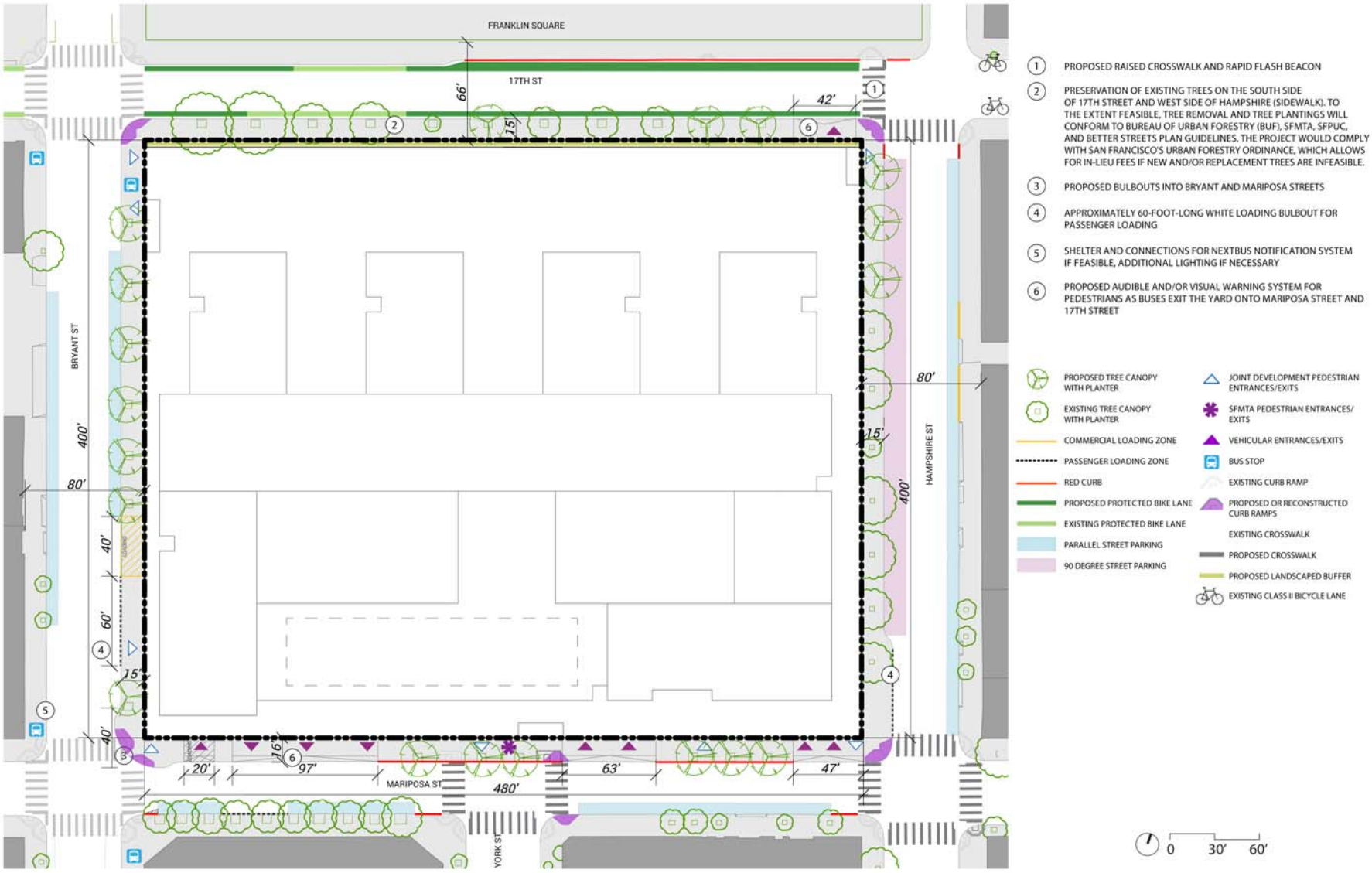
The project sponsor, the San Francisco Municipal Transportation Agency (SFMTA), proposes to replace the Potrero Yard Trolley Coach Facility at 2500 Mariposa Street (Potrero Yard). The Project would accommodate the expansion of the SFMTA's transit vehicle fleet in a new replacement structure that would include space for bus parking and circulation (up to 213 buses); SFMTA maintenance, operation, and administrative uses; and joint development uses (see **Table 1**). The new approximately 1,300,000 gross-square-foot (GSF) structure would occupy the 4.4-acre (192,000 square feet) site and rise to heights ranging from 75 to 150 feet. The new structure would contain a three-level, approximately 75-foot-tall replacement transit facility plus a mix of commercial and residential uses in the remainder of the Project as part of a joint development program between SFMTA and a private project co-sponsor. The joint development program would include a ground-floor commercial use (approximately 33,000 GSF) and residential entry lobbies, with integrated residential and transit facility uses on the second through sixth floors of the three-level replacement transit

[1] SFPUC, "Project Demand Memo for Preparation of WSA", September 6, 2016.

facility. Most of the residential development would be atop the replacement transit facility on the 7th to 13th floors.

Table 1. Basic Project Information

Project Address	2500 Mariposa Street
Project Block/Lot(s)	Block 3971/Lot 001
Planning Department Case Number	2019-021884ENV
ENV Case Manager	Laura Lynch / David Young
Zoning District	Public [P]
Height/Bulk	65-X
Estimated Construction Duration	2023-2026
Current Land Use(s)	SFMTA Bus Storage and Maintenance (PDR) SFMTA Offices
Proposed Land Use(s)	SFMTA Bus Storage and Maintenance (PDR) SFMTA Offices Residential Retail
Site Size (sf)	192,000
Site Size (acres)	4.4
Project Size (constructed GSF)	1,300,000
Days of Operation / Annually	365
Notes: *The areas used are constructed gross floor area (GSF) as required by the SFPUC Water Calculator. These areas do not include the deductions allowed under the San Francisco Planning Code for gross floor area.*	



EXACT STREET DESIGN TBD BY FUTURE TRAFFIC ENGINEER

Source: SFMTA and Sitelab, 2020

FIGURE 1: PROPOSED SITE PLAN

The three new transit levels in the replacement transit facility would be designed to include space for circulation (ramps, drive aisles, and vertical circulation), parking for 213 buses, 18 maintenance bays and maintenance support areas, operations, an SFMTA operator training center, storage (parts and battery-electric infrastructure), administrative uses/common areas (e.g., offices, conference rooms, break rooms), and joint development uses. A total of 310 vehicle spaces would be provided: 63 spaces for the 40-foot-long buses, 150 spaces for the articulated 60-foot-long buses, and 97 parking spaces for large and standard non-revenue vehicles. The Project is not proposing any off-street accessory vehicular parking for the entirety of the Project, including the proposed joint development. See **Table 2** for approximate floor areas for the replacement transit facility. Ramps would provide one-way internal driveways within the replacement transit facility so that buses can access the work bays, bus wash bays (one per level), and parking spaces on the three new transit levels.

Table 2. Proposed Project Constructed Gross Areas by Land Use

	GSF
Bus Service and Storage	186,000
Administration and Common Areas	52,000
Residential (575 units)	544,000
Commercial	33,000
Ramps and Drives	485,000
TOTAL	**1,300,000**
Notes: GSF= gross square feet.	

Of the 192,000 square foot (SF) project site, the building footprint is 189,860 SF, with a 5-foot wide planting strip along the 17th Street frontage (2,140 GSF). The building footprint includes 91,000 GSF of rooftop courtyard and 98,860 GSF of standard rooftop.

3 Existing Water Usage

Based on records supplied by SFMTA for the months of January and February 2020, the existing potable water demand is 3,500 gallons per day (gpd). Using the SFPUC Single Site calculator[2] (the SFPUC calculator) the existing 109,000 GSF of bus service/storage can be estimated to use 1,200 gpd. The remaining 2,300 gpd is assumed to be bus washdown use. There is no non-potable water system at the existing site.

4 Proposed Water Usage

One study for the Project was conducted using the SFPUC Single Site Water Calculator (Version 6). The three project variants only differ from the project in that they would shift the emergency exit location from 17th Street to Hampshire Street, would shift the residential

[2] SFPUC, "NP.xls", version 6, December 26, 2018

entrances from Mariposa Street to Hampshire Street, and would shift some of the active ground-floor uses (from Bryant Street to 17th Street). Thus, the proposed water uses under the project variants would be the same as the Project, and a separate study for the project variants is not required. A complete accounting of all proposed water uses, with water volumes listed in units of gallons per year based on output calculated by the SFPUC Water Calculator, is attached (see **Attachment 1**).

The default calculator assumptions and inputs were used as follows:

- "General Office" applied to administrative offices and common space
- "Retail" applied to general ground floor commercial
- "Service (e.g. financial, auto)" applied to bus service (maintenance + storage)

Non-defaults inputs include:

- HVAC demands estimates were provided by Arup (see **Attachment 2** for memo dated 7/1/2020) and assumed non-potable
- Bus washdown was calculated by scaling the existing demand from 158 to 213 buses per day
- No additional demand, beyond HVAC, was assumed for driveways and ramps.

The potable and non-potable demand estimates generated by the SFPUC Water Calculator are presented in **Table 3**. As shown, the total possible annual water demand is estimated to be 27,750,460 gallons per year (gpy) with potable demand at 17,460,806 gpy and non-potable demand at 10,289,654 gpy.

Table 3. Proposed Project Water Demands

Demand Type	Potable Demand (gpy)	Non-potable Demand (gpy)
DOMESTIC FIXTURES - Commercial		
Showerhead	6,857	-
Lavatory Faucet	94,035	-
Urinals	-	153,260
Toilet (Water Closet)	-	863,399
Kitchen Faucet	34,164	-
DOMESTIC FIXTURES - Multi-Family Residential		
Showerhead	4,496,908	-
Bathroom Faucet	822,605	-
Bath	1,054,622	-
Washing Machine	4,825,528	-
Toilet (Water Closet)	-	2,564,840
Kitchen Faucet	5,937,943	-
Dishwasher	188,145	-
HVAC/COOLING		
Cooling Tower Makeup Water	-	5,548,000
OTHER INDOOR DEMANDS		
Other Non-Potable Demand (Bus Washdown)	-	1,131,500
OUTDOOR DEMANDS		
Landscape Irrigation	-	28,655
TOTALS	**17,460,806**	**10,289,654**
Notes: gpy = gallons per year		

5 Project Phasing

The SFMTA estimates that construction of the Project would take three to four years to complete, with construction beginning in 2023 and building occupancy by the end of 2026. Because the Water Supply Assessment analyzes projected water supplies and demands through 2045 in five-year intervals and the Project construction is projected to be completed in 2026, demands estimated for the project are provided in this format in **Table 4**. The first column does not include water demands for the Project, as construction is not expected to be completed until 2026.

Table 4. Project Potable and Non-Potable Demand (2025-2045)

Demand of Proposed Project	2025	2026-2030	2030	2035	2040	2045
Potable Demand (mgd)	0.0000	0.0479	0.0479	0.0479	0.0479	0.0479
Non-potable Demand (mgd)	0.0000	0.0282	0.0282	0.0282	0.0282	0.0282
Total Demand (mgd)	0.0000	0.0762	0.0762	0.0762	0.0762	0.0762
Notes: mgd = million gallons per day.						

6 Overall Site Water Management

As this Project is subject to the requirements of the San Francisco Green Building Code requirements for water use reduction, Stormwater Management Requirements (SMRs) and the Non-potable Ordinance (NPO), as well as the Water Efficient Irrigation, Residential Water Conservation and Commercial Water Conservation Ordinances, there is a clear direction to reduce water consumption by pursuing a non-potable water reuse strategy that prioritizes the collection of rainwater to meet the SMRs and supplemental use of graywater to meet the NPO. Use of blackwater captured and treated on-site is not part of the Project's water re-use strategy. Further, based on site characteristics, foundation drainage is not expected to be an element of the non-potable water reuse strategy.

A water balance analysis of the potential alternative sources and projected non-potable demands was based on:

- Building constructed gross square footage (GSF)
- Occupancy load factors per the SFPUC calculator
- Water demand and fixture flowrates
- Pervious and irrigated open space areas

Rainwater and graywater will be collected and treated on site to meet the non-potable demands for toilet and urinal flushing, cooling tower make-up water and outdoor irrigation. The bus washdown water will be collected and treated onsite to be reused as bus washdown water. The reuse approach of rainwater and graywater is projected to offset 37% of the annual volume of potable water otherwise required for the Project and meets 100% of the required non-potable demands. A discussion how the Project will meet each requirement is presented in the following subsections.

6.1 Stormwater Management Requirements

The Project must comply with all SMRs regulated by the SFPUC, which require new and redevelopment projects to manage stormwater runoff using green infrastructure (GI) where feasible. GI is a stormwater management strategy that takes advantage of sustainable processes, such as infiltration and rainwater harvesting to manage stormwater runoff at its source.

As the project site is within the Combined Sewer System (CSS) area with an existing imperviousness of greater than 50%, the SMR requires a stormwater runoff rate and volume by 25% relative to pre-development conditions for the 2-year, 24-hour design storm. Additionally, the SMR requires project applicants to assess the feasibility of meeting this requirement using rainwater harvesting before looking to other stormwater management/GI approaches such as bioretention planters, permeable pavement, or green roofs.

The project sponsor is committed to harvesting 100% of the rainwater, which will require approximately 80,000 gallons of rainwater storage.

6.2 Non-potable Ordinance

The Project meets the criteria for and must comply with the City's NPO, which requires that new developments with greater than 250,000 square feet of gross floor area to implement an onsite water reuse system to meet non-potable demands. In general, the NPO requires that qualifying projects utilize where practicable rainwater (defined as runoff from building roofs and other above-ground surfaces, distinct from stormwater which in this context refers to runoff from at- or below-grade surfaces), graywater (wastewater from showers, bathroom sinks, and laundry), blackwater (wastewater containing bodily or other biological wastes, as from toilets, dishwashers, kitchen sinks, and utility sinks), or foundation drainage (nuisance subsurface water collected to maintain a building's structural integrity or to dewater below grade floors that would typically be discharged into the sewer system) and use these alternate water sources to meet the non-potable demands e.g. toilet/urinal flushing and irrigation.

To the maximum extent practicable, the Project will address the NPO by using rainwater and graywater captured and treated onsite to meet 100% of the toilet and urinal flushing and outdoor irrigation demands. The non-potable demand for toilet/urinal flushing, irrigation, and cooling tower makeup water is expected to be met by the Project's water reuse system.

6.3 Recycled Water Ordinance

The Project is not subject to the Recycled Water Ordinance as it is outside the designated water use areas.

6.4 Water Efficient Irrigation Ordinance

The Project meets the criteria for and must comply with the Water Efficient Irrigation Ordinance, which applies to projects with new or modified landscaping equal to or greater than 500 square feet. The Project will include more than 500 square feet of new landscaping and would comply with rules adopted by the SFPUC for Tier 2 project landscaping. The Project would install water efficient landscaping using primarily drought-tolerant planting, recycled water systems to provide non-potable water for irrigation, and a centrally controlled weather-based or other smart irrigation system. An application and a certificate of completion will be required.

6.5 Residential and Commercial Water Conservation Ordinances

The Project is subject to the residential water conservation ordinance. High-efficiency fixtures and appliances will be installed in compliance with current California plumbing standards.

The Project is not subject to the commercial water conservation ordinance as that is applicable only to alterations of existing commercial buildings.

The Project is subject to the San Francisco Green Building Code (Sections 4.103.2.2 and 5.103.1.2) which states that all new buildings must comply with current California water fixture and fitting efficiency requirements. The Project, as a new large commercial and high-rise residential project, will verify that it meets maximum fixture flow rates in accordance with the California Plumbing Code.

ATTACHMENTS:

1. SFPUC, "NP_SFMTA_PotreroYard.xlsx", July 19, 2020
2. ARUP, "HVAC Water Estimate for Potrero Bus Yard's CEQA Analysis (DEIR)", July1, 202

ATTACHMENT 1

NON-POTABLE WATER CALCULATOR

Project Summary Sheet

Project Contact: Licinia Iberri
(415) 646-2715
Licinia.Iberri@sfmta.com

Estimated Site/Building Permit Issuance Date: 1/1/2023

1. Demands and Supplies Summary

Grant Criteria Status: This building is 250,000 sq.ft. or greater in size and is not eligible for a grant

Demands Met by Non-Potable Supply for Project (gpy):	10,289,700	Meets grant criteria of offsetting a minimum of 1,000,000 gal/yr of potable water use
Demands Met by Non-Potable Supply for Project *:	37%	
Project Total Annual Water Demand (gpy) *:	27,750,460	
Project Total Annual Toilet + Irrigation Water Demand (gpy) *:	3,610,154	
Toilet + Irrigation Demands Met by Non-Potable Supply *:	100.0%	
Potable Water Allocation (gpy):	26,554,336	Potable supplies are allocated to this project to meet remaining demands. Projects are allocated an additional 10% in potable supplies that are available as a buffer.
Daily Wet Weather Potable Allocation (gpd):	72,984	Projects are allocated these potable supplies during wet weather months (October - March)
Daily Dry Weather Potable Allocation (gpd):	72,614	Projects are allocated these potable supplies during dry weather months (April - September)

*Note: Estimates for *Demands Met by Non-Potable Supply for Project* and *Project Total Annual Water Demand* based on Tab 6 - Building Potential Summary total water demand values. Manually entered non-potable demands that exceed auto-calculated non-potable demands from Tab 6 may result in Total Annual Water demands greater than the value used in this analysis.
Project Total Annual Toilet Water Demand and *Toilet Demands Met by Non-Potable Supply* based on Tab 6 - Building Potential Summary toilet demands.

2. Building Information Summary

Project / Building Name:	Potrero Yard Modernization Project
Project Address:	2500 Mariposa Street San Francisco, CA
Assessor's Block & Lot No. / APN:	3971001
Year Online:	2026

Building Type:	Mixres
(gross square footage or GSF):	1,300,000
Total Lot Size (ft^2):	192,000
Number of Residential Units:	575
Impervious Surface Above Grade (ft^2):	189,860
Impervious Surface Below Grade (ft^2):	189,860
Landscaped Area (ft^2):	2,140
Site Location (Zone):	Eastern SF

3. Summary of Non-Potable Demands and Supplies for the Project

Non-Potable Water Supply Estimates

On-site Alternate Water Source Supplies	Water Quantity (gpy)
Rainwater:	1,750,333
Stormwater:	0
Graywater:	10,170,499
Blackwater:	0
Foundation Drainage	0
Cooling & Other Supplies	1,131,500
TOTAL:	13,052,332

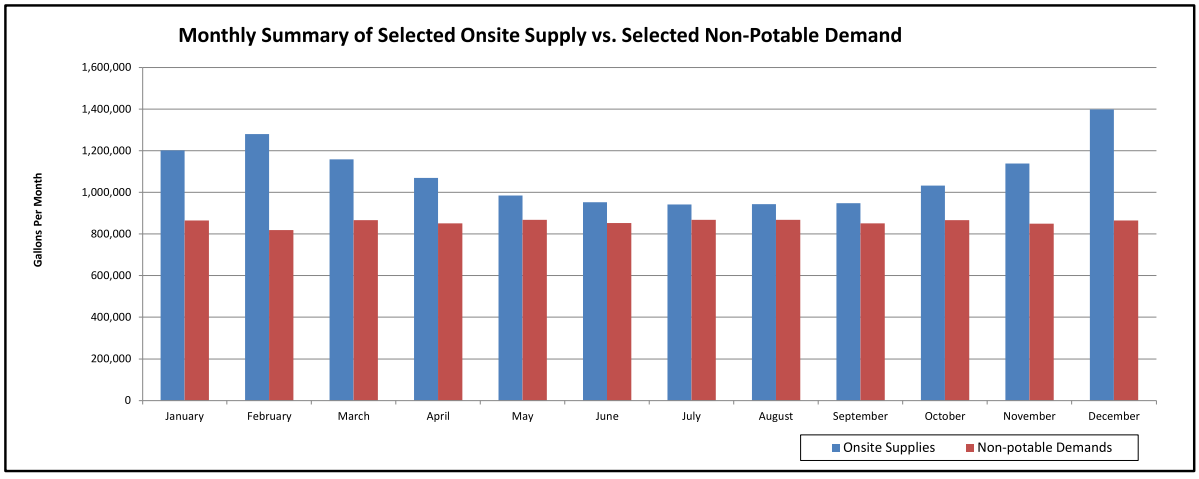
Non-Potable Water Demand Estimates

Project Specific Non-Potable Application Demands	Quantity (gpy)
Toilets/Urinals:	3,581,499
Irrigation:	28,655
Toilets/Urinals + Irrigation	3,610,154
Cooling Tower:	5,548,000
Commercial Laundry & Other	1,131,500
Total:	10,289,654

4. Project Summary

Demands Met by Non-Potable Supply for Projects (gpy):	10,289,700	
Total Water Demand (gpy):	27,750,460	Based on Tab 6 - Building Potential Summary tab
Total Water Demand Offset:	37%	
Potable Water Allocation (gpy):	26,554,336	Amount of Potable Water Allocated to Project to Meet Total Demands
Daily Wet Weather Potable Allocation (gpd):	72,984	Amount of Potable Water Allocated Daily during Wet Weather Months
Daily Dry Weather Potable Allocation (gpd):	72,614	Amount of Potable Water Allocated Daily during Dry Weather Months
Total Toilet + Irrigation Water Demand (gpy):	3,610,154	Based on Tab 6 - Building Potential Summary tab
Total Toilet + Irrigation Water Demand Offset:	100%	Based on Tab 6 - Building Potential Summary tab
Selected Toilet + Irrigation Water Demand (gpy):	3,610,154	Based on selections on Tab 7 - Project Definition
Selected Toilet + Irrigation Water Demand:	100%	Based on selections on Tab 7 - Project Definition

This offset analysis assumes the full year of supplies is available to offset non-potable demands. Some scenarios may require storage to store excess supplies from one month in order to use those supplies in another month with unmet demands.



ATTACHMENT 2

Memorandum

ARUP

To	Licinia Iberri, SFMTA	Date	July 1, 2020
Copies	Tim Kempf, SFPW	Reference number	272758
From	Rob Best; Ignacio Barandiaran	File reference	
Subject	HVAC Water Estimate for Potrero Bus Yard's CEQA analysis (DEIR)		

Arup has produced an estimate of the average daily water use required for a water-based cooling system for the Potrero Bus Yard development, including both the bus facility and the proposed residential development. This memo summarizes the estimate, the calculation approach, and key assumptions. The water use estimate is intended to serve as a likely estimate for the analysis supporting the Draft Environmental Impact Report (DEIR), and is based on benchmarks from similar projects. It does not represent an actual design for the Potrero Bus Yard cooling system.

Based on the assumptions and calculation approach below, we have estimated that the likely average daily water usage for the project is **15,200 gallons per day** (or 11 gallons per minute). This represents the makeup water required for cooling towers. Other systems (e.g., chillers, boilers) are closed systems and do not require makeup water in normal operation. Note that this is an average flow per day for the year. We estimate that on the peak cooling day, up to 29,300 gallons of makeup water may be required. However, given the mild weather in San Francisco, this peak day is not representative of the annual condition. Furthermore, this estimate has been based on a water-based cooling system, using typical estimates of building cooling loads. Further design refinement may reduce the cooling load or select lower water use HVAC systems, thereby reducing the proposed water use.

Assumptions and Calculation

The estimate of cooling water use has been based on the program outlined in the June 12, 2020, SFMTA Potrero Yard Modernization Project Request for Qualifications, Appendix D. The areas for each program type have been consolidated from the table provided within that document and used to generate likely cooling loads using cooling load benchmarks by space type. These benchmarks are based on recent Arup projects in San Francisco at a similar stage of design. It is possible that the final design will improve upon these benchmarks, but these are intended to represent a typical building for the area. The table below provides the areas and cooling benchmarks assumed, and the resulting cooling load by space type.

Memorandum

Land Use Category	Space Type	Area (SF)	Cooling Density (SF/Ton)	Total Cooling Load (Tons)
Bus Facility	Storage	186,000	700	266
	Bus Administration	52,000	400	130
	Parking/Circulation	485,000	0	-
Residential	Residential	394,000	700	563
	Circulation	66,000	700	94
	Common Area	7,000	700	10
	Storage	58,000	700	83
Shared	Circulation	19,000	400	48
Commercial	Active Use	33,000	350	94
			Total Cooling Load	**1,288**
			Rounded Cooling Load	**1,300**

The 1,300 ton assumed cooling load can be provided by a variety of system types. To estimate water use for the project, we have assumed that cooling would be provided by a cooling tower coupled either to a central chiller or water source heat pumps located in each unit or non-residential zone. Cooling towers have significant water use due to evaporation of water. Cooling towers filter water through an evaporative medium and use a fan to draw air over the medium to cool the water. Water is lost in this process both through drift, where water particles are carried away by the induced draft from the fan, and by evaporation as the water cools. Drift is assumed to be 0.005% of the total water circulation, while evaporation is based both on the temperature change desired in the cooling tower and the flow rate. For this estimate, we have assumed that the cooling tower temperature change is 15 degrees Fahrenheit.

In addition, cooling tower water can only be circulated a fixed number of times through the tower before it must be drained and replaced. This is based on the buildup of chemical compounds naturally present in the water that at high concentrations can be harmful to the cooling equipment. For this estimate, we have assumed that water can be cycled through the cooling tower 6 times before it must be flushed. This is a typical value for cooling towers, particularly given the LEED goals for the project, and can be increased with additional condenser water treatment, thereby reducing the concentration of chemicals in the cooling tower water.

Based on the cooling load of 1,300 tons, we assume a peak cooling tower circulation rate of 3,120 GPM. Of this, at peak flow, 37.5 GPM is anticipated to be lost to evaporation, 0.16 GPM to drift, and

7.5 GPM to reducing the concentration of chemicals built up in the water. Combining these flows leads to a peak makeup water requirement of 45.1 GPM. However, this peak can be assumed to occur only in a small number of hours per year. Given the variation in weather within a single day, between days and weeks, and throughout the year, experience from similar projects in San Francisco has indicated that the average cooling tower makeup water flow is approximately 24% of the peak flow. Using this factor, leads to the results shown in the table below.

	Peak		**Average**	
Instantaneous Makeup Water	45	GPM	11	GPM
Hourly Makeup Water	2,719	GPH	640	GPH
Daily Makeup Water	29,300	GPD	15,200	GPD

Note that the average values should be used for calculation of likely water use throughout the year, rather than the peak.

APPENDIX C

San Francisco Public Works' Standard Construction Measures for Public Works Projects and Draft Construction Contract Procedures

SAN FRANCISCO PUBLIC WORKS

Edwin M. Lee
Mayor

Mohammed Nuru
Director

San Francisco Public Works
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twitter.com/mrcleansf

June 26, 2017

TO: Public Works Staff

FROM: Mohammed Nuru, Director

SUBJECT: Standard Construction Measures for Public Works Projects

With the issuance of these Standard Construction Measures ("Measures"), I direct Public Works staff to incorporate these Measures into Public Works projects. The purpose of these measures is for Public Works to adopt environmentally responsible practices to apply to Public Works projects.

In addition to complying with applicable local, State, and federal laws and regulations, these Measures are to be followed as a standard practice in the execution of every Public Works project. While some of the Measures may not apply to a project, it is important to address each of the Measures either by implementing the Measure as described, or by documenting in a note to file why it is not applicable to the particular project. Some of the Measures are very broad and will be tailored to suit each project site and surrounding circumstances, which may involve undertaking further investigation and developing a more detailed work plan to address the resource or impact addressed by a specific measure.

For projects that undergo full CEQA review (Mitigated Negative Declarations or Environmental Impact Reports), are assigned environmental commitments as part of the NEPA process, and/or receive resource agency permits (e.g., US Army Corps of Engineers, California Department of Fish and Wildlife, etc.), these Measures may be superseded and/or amplified with more detailed, project-specific mitigation measures or conditions stipulated in the project CEQA document and/or permits.

The responsibility for implementation of the Standard Construction Measures rests with each Public Works Project Manager. If you have any questions please contact Boris Deunert, Manager, Regulatory Affairs Section, at 415-558-4011.

Please begin implementing these Measures immediately. Thank you for your cooperation.

Public Works Standard Construction Measures

1. SEISMIC AND GEOTECHNICAL STUDIES: The project manager shall ensure that projects that may potentially be affected by existing soil, slope and/or geologic conditions at the project site will be screened for liquefaction, subsidence, landslide, fault displacement, and other geological hazards at the project site, and will be engineered and designed as necessary to minimize risks to safety and reliability due to such hazards. As necessary, geotechnical investigations will be performed.

2. AIR QUALITY: All projects will comply with the Construction Dust Control Ordinance (see Attachment A). Major construction projects that are estimated to require 20 or more days of cumulative days of work within the Air Pollutant Exposure Zone must comply with the additional clean construction requirements of the Clean Construction Ordinance (see Attachment B).

3. WATER QUALITY: All projects will implement erosion and sedimentation controls to be tailored to the project site, such as fiber rolls and/or gravel bags around stormdrain inlets, installation of silt fences, and other such measures sufficient to prevent discharges of sediment and other pollutants to storm drains and all surface waterways, such as San Francisco Bay, the Pacific Ocean, water supply reservoirs, wetlands, swales, and streams. As required based on project location and size, a Stormwater Control Plan (in most areas of San Francisco) or a Stormwater Pollution Prevention Plan (SWPPP) (in certain areas of San Francisco) will be prepared. If uncontaminated groundwater is encountered during excavation activities, it will be discharged in compliance with applicable water quality standards and discharge permit requirements. Groundwater contamination is addressed in item 6 below.

4. TRAFFIC: All projects will implement traffic control measures sufficient to maintain traffic and pedestrian circulation on streets affected by construction of the project. The measures will also, at a minimum, be consistent with the requirements of San Francisco Municipal Transportation Agency (SFMTA)'s Blue Book. Traffic control measures may include, but not be limited to, flaggers and/or construction warning signage of work ahead; scheduling truck trips during non-peak hours to the extent feasible; maintaining access to driveways, private roads, and off-street commercial loading facilities by using steel trench plates or other such method; and coordination with local emergency responders to maintain emergency access. Any temporary rerouting of transit vehicles or relocation of transit facilities would be coordinated with SFMTA Muni Operations.

5. NOISE: All projects will comply with local noise ordinances regulating construction noise. Public Works shall undertake measures to minimize noise disruption to nearby neighbors and sensitive receptors during construction. These efforts could include using best

available noise control technologies on equipment (i.e., mufflers, ducts, and acoustically attenuating shields), locating stationary noise sources (i.e., pumps and generators) away from sensitive receptors, erecting temporary noise barriers, and other such measures.

During nighttime construction activities, the following shall apply: impact tools and vibratory pile drivers shall have intake exhaust mufflers and/or acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works; the construction contractor shall avoid using water blasters; and the use of vehicles that are legally required to be equipped with backing warning alarms will be reduced to the extent feasible; and administrative controls as defined in the California Code of Regulations, Title 8 Sec. 1592 will be used for worker protection for backing movements by other vehicles. Hours of vibration-intensive activities, such as vibratory pile driving, shall be restricted to between 7:00 a.m. and 8:00 p.m.

6. HAZARDOUS MATERIALS: Projects that involve excavation of 50 cubic yards of soil in the Maher Z will comply with the Maher Ordinance (see Attachment C). Projects on sites that are not currently located in the Maher Zone but have the potential to contain hazardous materials in soil and/or groundwater will be referred to the Department of Public Health as newly identified Maher sites.

7. BIOLOGICAL RESOURCES: Public Works will comply with all local, State, and federal requirements for surveys, analysis, and protection of biological resources (e.g., Migratory Bird Treaty Act, Federal and State Endangered Species Acts, etc.). All project sites and the immediately surrounding area will be screened to determine whether biological resources may be affected by construction. If biological resources are present, a qualified biologist will carry out a survey of the project site to note the presence of general biological resources and to identify whether habitat for special-status species and/or migratory birds is present. If necessary, measures will be implemented to protect biological resources, such as installing wildlife exclusion fencing, establishing work buffer zones, installing bird deterrents, monitoring by a qualified biologist and other such measures. If tree removal is required, Public Works will comply with any applicable tree protection ordinance.

8. VISUAL AND AESTHETIC CONSIDERATIONS, PROJECT SITE: All project sites will be maintained in a clean and orderly state. Construction staging areas will be sited away from public view, and on currently paved or previously disturbed areas, where possible. Nighttime lighting will be directed away from residential areas and have shields to prevent light spillover effects. Upon project completion, project sites on City-owned lands will be returned to their general pre-project condition, including re-grading of the site and re-vegetation or re-paving of disturbed areas to the extent this is consistent with Public Works Bureau of Urban Forestry policy and San Francisco Code. Project sites on non-City land will be restored to their general

pre-project condition so that the owner may return them to their prior use, unless otherwise arranged with the property owner.

9. CULTURAL RESOURCES: All projects that will alter a building or structure, produce vibrations, or include soil disturbance[1] will be screened to assess whether cultural resources are or may be present and could be affected, as detailed below.

Archeological Resources. No archeological review is required for a project that will not entail soil disturbance. Projects involving soil disturbance will initially be screened by Public Works Regulatory Affairs staff to identify whether there is demonstrable evidence of prior soil disturbance at the project site to the maximum vertical and horizontal extent of the current project's planned disturbance. Public Works will complete the Public Works Preliminary Archeological Checklist (PAC), Part I only (see Attachment D). For projects where prior complete soil disturbance has occurred throughout areas of planned work, Public Works will provide evidence of the previous disturbance in the environmental application to be reviewed by EP Archeological staff.

1) For projects that are on previously undisturbed sites or where the depth/extent of prior soil disturbance cannot be documented, or where the planned project-related soil disturbance will extend beyond the depth/extent of prior soil disturbance, additional screening will be carried out as detailed below and shown on the flow chart titled "Public Works Standard Construction Measure #9 Archeological Assessment Process" (see Attachment E). The EP Archeologist will complete the Preliminary Archeological Checklist, Part II (PAC) for the project, which will include recommendations for one of three Standard Archeological Measures (I - Discovery, II – Monitoring, or III – Testing/Data Recovery) to be implemented by Public Works to protect and/or treat significant archeological resources identified as being present within the site and potentially affected by the project (see Attachments F, G, and H). Additional research and documentation, such an Archeological Research Design and Treatment Plan (ARDTP), Archeological Sensitivity Study (ASA), or an archeological field survey, may also be requested by the EP Archeologist. These documents should be completed by a qualified consultant from the EP Archeological Resources Consultant Pool and should by scoped, reviewed, and approved by the EP Archeologist.

2) Public Works shall implement the PAC recommendations prior to and/or during project construction consistent with Standard Archeological Measures I, II, and III, and shall consult with the EP Archeologist in selecting a qualified archeological consultant from

[1] **Soil is defined as native earthen deposits or introduced earthen fill. Soil does not include materials that were previously introduced as part of the roadway pavement section including asphalt concrete wearing surface, roadway base, and subbase.**

the EP Archeological Resources Consultant Pool, as needed, to implement these measures.

3) Soil-disturbing activities in archeologically sensitive areas, as identified through the above screening, will not begin until required preconstruction archeological measures of the PAC (e.g., preparation of an Archeological Monitoring Plan, Archeological Treatment Plan, and/or an Archeological Research Design and Data Recovery Plan) have been implemented.

Public Works, the EP Archeologist and the ERO will revisit the PAC process outlined above one year after these measures are finalized.

Historic (Built Environment) Resources. Public Works will consult with CCSF Planning Department Preservation staff to determine if projects that would modify an existing building, structure, or landscape feature require preservation review and if a Historic Resource Evaluation (HRE) will be required. The HRE will be prepared by a qualified architectural historian and will be scoped with CCSF Planning Department Preservation staff. Where the potential for the project to have adverse effects on an historical resource is identified by CCSF Planning Department Preservation staff, the CCSF Planning Department Preservation Planner will consult with Public Works to determine if the project can be conducted as planned or if the project design can be revised to avoid the significant impact. If these options are not feasible, the project will need to undergo further environmental review with the CCSF Planning Department and mitigation may be required. If so, the project would not qualify for a Categorical Exemption from CEQA review.

Within historic districts established by ordinance, and/or mapped by the San Francisco Planning Department as eligible for or on the California Register of Historic Resources and/or the National Register of Historic Places, all distinctive sidewalk elements such as brick surfacing, brick gutters, granite curbs, cobblestones and non-standard sidewalk scoring, and streetscape elements that may include, but are not limited to, streetlights, sidewalk lights, sidewalk elevators and chutes, benches, and utility plates, that appear to be 45 years or older will be treated as potentially character-defining features of their respective historic districts. For those locations, historic materials will be protected in place (preferred method), salvaged and re-installed, or replaced in-kind to match the existing color, texture, material, and character of the existing condition.

Where construction will take place in proximity to a building or structure identified as a significant historical resource but would not otherwise directly affect it, Public Works will implement protective measures, such as but not limited to, the erection of temporary construction barriers to ensure that inadvertent impacts to such buildings or structures are avoided. These measures shall require the development of a Construction Best Practices for

Historical Resources Plan and a plan outlining the Construction Monitoring for Historical Resources Program to be reviewed and approved by CCSF Planning Department Preservation staff.

If a project includes or is directly adjacent to historic buildings or structures susceptible to vibration (such as but not limited to unreinforced masonry, earthen construction, lathe and plaster, or fragile architectural ornamentation) as determined in consultation with CCSF Planning Department Preservation staff, Public Works will determine if vibrations associated with proposed construction activities has the potential to cause damage to such buildings or structures. Generally, vibration below 0.12 inches per second peak particle velocity does not have the potential to damage sensitive buildings or structures. A vibration study may be necessary to determine if such vibration levels will occur. If Public Works determines in consultation with CCSF Planning Department Preservation staff that vibration damage may occur, Public Works will engage a qualified historic architect or historic preservation professional to document and photograph the pre-construction condition of the building and prepare a plan for monitoring the building during construction. The monitoring plan will be submitted to and approved by CCSF Planning Department Preservation Planner prior to the beginning of construction and will be implemented during construction. The monitoring plan will identify how often monitoring will occur, who will undertake the monitoring, reporting requirements on vibration levels, reporting requirements on damage to adjacent historical resources during construction, reporting procedures to follow if such damage occurs, and the scope of the preconstruction survey and post-construction conditions assessment.

If any damage to a historic building or structure occurs, Public Works will modify activities to minimize further vibration. If any damage occurs, the building will be repaired following the Secretary of the Interior's Standards for the Treatment of Historic Properties under the guidance of a qualified historic architect or historic preservation professional in consultation with CCSF Department Preservation Planner.

cc: Lisa Gibson, Environmental Review Officer, San Francisco Planning Department

ATTACHMENTS

A. Construction Dust Measures
B. Clean Construction Measures
C. Maher Compliance
D. Public Works Preliminary Archeological Checklist (PAC)

E. Flow Chart: Public Works Standard Construction Measure #9 Archeological Assessment Process
F. Public Works Archeological Measure I (Archeological Discovery)
G. Public Works Archeological Measure II (Archeological Monitoring)
H. Public Works Archeological Measure III (Archeological Testing/Data Recovery)

Attachment A: Public Works Dust-Control Measures

For the purposes of this document, "sensitive receptor" means residence, school, childcare center, hospital or other health-care facility or group living quarters, and "visible dust" means dust comprising visible emissions as defined in Bay Area Air Quality Management Board Regulation 6 – Particulate Matter.

For all projects, Public Works will institute though its construction specifications the following dust-control measures to achieve a goal of no visible dust emissions:

- Clean up spillage on City streets, whether directly or indirectly caused by construction operations.
- Remove demolition debris from the Site no later than the end of each workday. Any hazardous materials and/or suspected hazardous materials stored on site shall be stored in accordance with all applicable Cal EPA regulations, including being stored in proper containers and being protected from exposure from the elements. Any such materials shall be removed from the site as soon as possible for disposal/recycling in accordance with all applicable statutes and regulations.
- Keep the Site and adjacent areas clean and perform wet sweeping at the end of each shift.
- Perform continuous water spraying during dust generating activities. Mist or spraying shall be conducted in such a way as to prevent puddling or generation of runoff. Mist any immediate area of demolition with a water spray to prevent airborne dust particles.
- Wet all exposed soil surfaces at least three times daily during dry weather or more frequently if dust is blowing or if required by the City. Any serpentine residuals on the street shall be wet swept immediately.
- Use dust enclosures, curtains, and dust collectors as necessary to control dust.
- Load haul trucks, hauling debris, soils, sand or other such materials so that the material does not extend above the walls or back of the truck bed. Wet before covering and tightly cover the surface of each load before the haul truck leaves the loading area.
- Limit vehicle speed limit on unpaved roads to 15 miles per hour (mph).
- Cover any inactive (no disturbance for more than seven days) stockpiles greater than ten cubic yards or 500 square feet of excavated materials, backfill material, import material, gravel, sand, road base, and soil with a 10 mil (0.01 inch) polyethylene plastic or equivalent tarp and brace it down or use other equivalent soil stabilization techniques.
- Reclaimed water will be used for all dust-control operations to the extent feasible (without resorting to extraordinary means and measures) and allowed by law.

If the project grades or excavates more than one half acre surface area at any given time, and the project is within 1,000 feet of a sensitive receptor as defined above, Public Works or its contractor shall prepare a Site-Specific Dust Control Plan for the review and approval of the Department of Public Health. The site-specific dust control plan shall contain mapping identifying locations of sensitive receptors and contain additional site-specific dust monitoring and control measures that will apply to the project. These site-specific measures may include the following or equivalent measures, which accomplish the goal of minimizing visible dust:

- Wetting down areas around soil improvement operations, visibly dry disturbed soil surface areas, and visibly dry disturbed unpaved driveways at least three times per shift per day.
- Analysis of the wind direction.
- Placement of upwind and downwind particulate dust monitors.
- Recordkeeping for particulate monitoring results.
- Hiring of an independent third party to conduct inspections for visible dust and keeping records of those inspections.
- Requirements for when dust generating operations have to be shut down due to dust crossing the property boundary or if dust is contained within the property boundary but not controlled after a specified number of minutes.
- Establishing a hotline for surrounding community members to call and report visible dust problems so that Public Works or its contractor can promptly fix those problems; posting signs around the site with the hotline number and making sure that the number is given to adjacent residents, schools and businesses.
- Limiting the area subject to excavation, grading, and other demolition or construction activities at any one time.
- Minimizing the amount of excavated material or waste materials stored at the site.
- Installing dust curtains, plastic tarps or windbreaks, or planting tree windbreaks on the property line on windward and down windward sides of construction areas, as necessary.
- Paving, applying water three times daily, or applying non-toxic soil stabilizers on all unpaved access roads, parking areas and staging areas at the construction site. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code, Article 22. If not required, reclaimed water should be used whenever possible.
- Establishing speed limits so that vehicles entering or exiting construction areas shall travel at a speed that minimizes dust emissions. This speed shall be no more than 15 mph.
- Installing wheel washers to clean all trucks and equipment leaving the construction site. If wheel washers cannot be installed, tires or tracks and spoil trucks shall be brushed off before they re-enter City streets to minimize deposition of dust-causing materials.
- Terminating excavation, grading, and other construction activities when winds speeds exceed 25 mph.
- Hydroseeding inactive construction areas, including previously graded areas inactive for at least 10 calendar days, or applying non-toxic soil stabilizers.
- Sweeping of surrounding streets during demolition, excavation and construction at least once per day to reduce particulate emissions.

SECTION 01 35 48

ADDITIONAL CLEAN CONSTRUCTION REQUIREMENTS ON MAJOR CONSTRUCTION PROJECTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section 01 35 48 incorporates additional requirements of the San Francisco Clean Construction Ordinance ("Ordinance") for projects that meet the requirements of Environment Code Section 2504(a), which are located in the Air Pollutant Exposure Zone and which are within 1,000 feet of a Sensitive Use, as set forth in Chapter 25 of the Environment Code and Section 6.25 of the Administrative Code.

B. For projects that meet Environment Code Section 2504(b), which are located outside the Air Pollutant Exposure Zone, or which are in the Air Pollutant Exposure Zone but are not within 1,000 feet of a Sensitive Use, refer to Section 00 73 73, Article "CLEAN CONSTRUCTION REQUIREMENTS ON MAJOR CONSTRUCTION PROJECTS."

C. The Department of the Environment is responsible for administering the Ordinance. For more information about the Ordinance and its implementation, please visit the Department of Public Health website at: https://www.sfdph.org/dph/EH/Air/CleanConstruction.asp and https://www.sfdph.org/dph/files/EHSdocs/AirQuality/San_Francisco_Clean_Construction_Ordinance_2015.pdf.

1.02 DEFINITIONS

A. "Air Pollutant Exposure Zone" means a zone having a substantially greater than average concentration of air pollutants as defined in Health Code Section 3804.

B. "Alternative Fuels" means any transportation fuel that is less polluting than gasoline or petroleum diesel fuel, as determined by the California Air Resource Board and that is shown to have lower lifecycle carbon emissions than gasoline or petroleum diesel. Alternative Fuels may include, but are not limited to: natural gas; propane; biofuels from low carbon, sustainable and preferably local sources; hydrogen produced from low carbon and/or renewable sources; and electricity.

C. "Alternative Sources of Power" means utility-based electric power or other power sources other than diesel engines.

D. "ARB" means the California Air Resources Board.

E. "Clean Construction" means the performance of all work required to be performed under a Public Works contract meeting the requirements in Sections 2504, 2505 and 2506 of the Environment Code, as applicable.

F. "Construction" means building, demolition, excavation, grading or foundation work, whether or not the work requires a City permit.

G. "Construction Activities" means the performance of all work involved in or required for Construction, except for the issuance or obtaining of a site permit for a project.

H. "Construction Phase" means a particular construction activity over a certain period of time. Construction phases may include, but are not limited to, demolition, site preparation, grading, building construction, architectural coatings, and paving. Multiple Construction Phases of a single project may take place at the same time.

I. "Equipment" means off-road and on-road equipment.

J. "Equipment Type" means a category of off-road equipment. Types of off-road equipment include bore/drill rigs, cranes, crawler tractors, excavators, graders, off-highway tractors, off-highway trucks, other construction equipment, pavers, paving equipment, rollers, rough terrain forklifts, rubber-tired dozers, rubber-tired loaders, scrapers, skid steer loaders, surfacing equipment, tractors/loaders/backhoes, and trenchers.

K. "Major Construction Project" means a public work to be performed within the geographic limits of the City that uses off-road equipment and that is estimated to require 20 or more cumulative days of work, including non-consecutive days, to complete.

L. "Most Effective Verified Diesel Emission Control Strategy" means a device, system or strategy that is verified, pursuant to Division 3, Chapter 14, of Title 13 of the California Code of Regulations, to achieve the highest level of pollution control tram an off-road vehicle.

M. "Off-Road Engine" means a non-road engine as defined in Title 40 of the Code of Federal Regulations, Section 89.2.

N. "Off-Road Equipment" means equipment with an off-road engine having greater than 25 horsepower and operating for more than 20 total hours over the entire duration of Construction Activities.

O. "On-Road Equipment" means a heavy-duty vehicle as defined in Title 40 of the Code of Federal Regulations, Section 86.1803-01.

P. "Portable Diesel Engine" means a diesel engine that is portable as defined in 71 California Code of Regulations, Section 93116.2(bb).

Q. "Sensitive Use" means a category of building use identified as a "Sensitive Use" in Health Code Section 3804.

R. "Tier 2 Off-Road Emission Standards" means the Tier 2 new engine emission standards in Title 13, California Code of Regulations, Section 2423(b)(1)(A) and/or Title 40, Code of Federal Regulations, Part 89.112(a).

S. "VDECS" means a verified diesel emission control strategy, designed primarily for the reduction of diesel particulate matter emissions, which has been verified by ARB pursuant to "Verification Procedures, Warranty and In-Use Strategies to Control Emissions from Diesel Engines," Title 13, California Code of Regulations, Sections 2700-2710. VDECS can be verified to achieve Level 1 diesel particulate matter reductions (at least 25 percent), Level 2 diesel particulate matter reductions (at least 50 percent), or Level 3 diesel particulate matter reductions (at least 85 percent).

1.03 SUBMITTALS

A. Construction Emissions Minimization Plan:

1. Contractor shall submit its initial Construction Emissions Minimization Plan no less than 28 days prior to mobilization. (See Subsection 1.04B.)

2. Contractor shall submit an updated Construction Emissions Plan on a quarterly basis in compliance with Subsection 1.04B.5.a, and submit each quarterly report within seven business days of the end of each quarter.

3. Contractor shall submit a final Construction Emissions Minimization Plan report summarizing construction activities within two weeks of achieving Substantial Completion in compliance with Subsection 1.04B.5.b.

B. Clean Construction Emissions Plan Certification Statement: Contractor shall submit this statement with its Construction Emissions Minimization Plan. (See Subsection 1.04B.3.)

C. Waiver Request: Contractor shall submit a waiver request to the Department Head no less than two weeks prior to the planned use of a specific piece of off-road equipment. (See Subsection 1.05A.)

1.04 REQUIREMENTS FOR MAJOR CONSTRUCTION PROJECTS WITHIN THE AIR POLLUTANT EXPOSURE ZONE

A. For all Major Construction Projects that meet the requirements of Environment Code Section 2504(a) and which are located in the Air Pollutant Exposure Zone and within 1,000 feet of a Sensitive Use, the following requirements apply:

1. All off-road equipment shall have engines that (a) meet or exceed either United States Environmental Protection Agency or ARB Tier 2 off-road

emission standards, and (b) have been retrofitted with an ARB Level 3 VDECS. Equipment with engines meeting Tier 4 Interim or Tier 4 Final off- road emission standards automatically meet this requirement. See Section 1.05A regarding the procedure for requesting a waiver to this requirement.

2. Where access to alternative sources of power is available, use of portable diesel engines to perform work on the project shall be prohibited. See Section 1.05B regarding the waiver procedure for this requirement.

3. Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than two minutes at any location, except as allowed for in applicable state regulations regarding idling for off-road and on-road equipment (e.g., traffic conditions, safe operating conditions). The Contractor shall post legible and visible signs, in English, Spanish, and Chinese, in designated queuing areas and at the construction site to remind operators of the idling limit. Refer to the following link for the Clean Construction Sign Template: https://www.sfdph.org/dph/EH/Air/CleanConstruction.asp.

4. The Contractor shall instruct construction workers and equipment operators on the maintenance and tuning of construction equipment, and require that such workers and operators properly maintain and tune equipment in accordance with manufacturer specifications.

B. Construction Emissions Minimization Plan: All Major Construction Projects that meet the requirements of Environment Code Section 2504(a), which are located in the Air Pollutant Exposure Zone and are within 1,000 feet of a Sensitive Use, also must comply with the following requirements:

1. Before starting on-site Construction Activities, the Contractor shall submit a Construction Emissions Minimization Plan ("Emissions Plan") to the City Representative for review and approval. The Emissions Plan shall state, in reasonable detail, how the Contractor will meet the requirements of Section 2505 of the Environment Code.

2. The Emissions Plan shall include estimates of the construction timeline by phase, with a description of each piece of off-road equipment required for each Construction Phase.

   a. The description may include, but is not limited to: equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel usage and hours of operation.

   b. For the VDECS installed, the description may include, but is not limited to: technology type, serial number, make, model,

manufacturer, ARB verification number level, and installation date and hour meter reading on installation date.

c. For off-road equipment using alternative fuels, the description shall also specify the type of alternative fuel.

d. Contractor may use the Clean Construction Equipment Inventory Template to satisfy the Emissions Plan requirements. Refer to the following link for that template: https://www.sfdph.org/dph/EH/Air/CleanConstruction.asp.

3. The Contractor agrees to comply fully with the Emissions Plan and acknowledges that a significant violation of the Emissions Plan shall constitute a material breach of the Agreement. Contractor must submit a signed Clean Construction Emissions Plan Certification Statement to the City Representative. Refer to the following link for the Emissions Plan Certification Statement Template: https://www.sfdph.org/dph/EH/Air/CleanConstruction.asp.

4. After City review and approval, the Contractor shall make the Emissions Plan available to the public for review onsite during working hours.

a. The Contractor shall post at the construction site a legible and visible sign summarizing the Emissions Plan. Refer to the following link for the Clean Construction Sign Template: https://www.sfdph.org/dph/EH/Air/CleanConstruction.asp.

b. The sign shall also state that the public may ask to inspect the Emissions Plan for the project at any time during working hours, and shall explain how to request to inspect the Emissions Plan.

c. The Contractor shall post at least one copy of the sign in a visible location on each side of the construction site facing a public right-of-way.

5. Reporting:

a. After Construction Activities begin, the Contractor shall update the Emissions Plan on a quarterly basis documenting changes from the original plan and demonstrating compliance with the Emissions Plan. The report shall be submitted to the City Representative quarterly and a copy shall also be maintained at the construction site.

b. Prior to receiving a Notice of Final Completion, or within six months of completion of Construction Activities if a final certificate of acceptance is not required, the Contractor shall submit to the City Representative a final report summarizing Construction Activities, including the start and end dates and duration of each Construction Phase, and the specific information required in the Emissions Plan.

1.05 WAIVERS

A. Waivers Under Subsection 1.04A.

1. The Contractor may request to waive the equipment requirements of Paragraph 1.04A.1 if: (a) a particular piece of off-road equipment with an ARB Level 3 VDECS is technically not feasible; (b) the equipment would not produce desired emissions reduction due to expected operating modes; (c) installation of the equipment would create a safety hazard or impaired visibility for the operator; or, (d) there is a compelling emergency need to use off-road equipment that is not retrofitted with an ARB Level 3 VDECS.

2. Contractor shall submit a waiver request to the Department Head, or designee, no less than two weeks prior to the planned use of a specific piece of off-road equipment.

3. If the Department Head, or designee, grants the waiver specified in Section 1.05A.1, the Contractor must use the next cleanest piece of off-road equipment, according to Table 1, below.

Table 1
Off-Road Equipment Compliance Step Down Schedule*

Compliance Alternative	Engine Emission Standard	Emissions Control
1	Tier 2	ARB Level 2 VDECS
2	Tier 2	ARB Level 1 VDECS
3	Tier 2	Alternative Fuel**

* If the City determines that the equipment requirements cannot be met, the Contractor must meet Compliance Alternative 1. If the City determines that the Contractor cannot supply off-road equipment meeting Compliance Alternative 1, then the Contractor must meet Compliance Alternative 2. If the City determines that the Contractor cannot supply off-road equipment meeting Compliance Alternative 2, then the Contractor must meet Compliance Alternative 3.

** Alternative fuels are not a VDECS

B. Waivers Under Subsection 1.04A.2.

1. The Department Head, or designee, may waive the alternative source of power requirement set forth in Subsection 1.04A.2 if an alternative source of power is limited or infeasible at the project site. If the City grants the waiver, the Contractor must submit documentation that the equipment used for onsite power generation meets the requirements of Subsection 1.04A.1, above.

C. All Other Waivers: The Department Head or designee also may waive the requirements of the Ordinance on the grounds set forth in Section 2507 of the Environment Code.

D. For any waiver granted in this Subsection 1.05, the City Representative will within two business days prepare a written notice of the waiver and a written memorandum explaining the basis for the waiver and the steps that will be taken to safeguard public and City employee health during the noncomplying work. The memorandum will also state the steps that the City and the Contractor will take to minimize the use of noncomplying equipment or engines during the noncomplying work.

1.06 NONCOMPLIANCE AND PENALTIES

A. Liquidated Damages: By entering into the Agreement, Contractor and City agree that if Contractor uses off-road equipment and/or off-road engines in violation of the Clean Construction requirements set forth in Administrative Code Section 6.25 and Chapter 25 of the Environment Code, the City will suffer actual damages that will be impractical or extremely difficult to determine. Accordingly, Contractor and the City agree that Contractor shall pay the City the amount of $100 per day per each piece of off-road equipment and each off-road engine used to complete Work on the Project in violation of the Ordinance. Such amount shall not be considered a penalty, but rather agreed monetary damages sustained by City because of Contractor's failure to comply with the Clean Construction requirements.

B. False Representations: False representations by the Contractor, in connection with the bidding, execution or performance of any City contract, regarding the nature or character of the off-road equipment and/or off-road engines to be utilized, on the contract, or to the City about the nature or character of the off-road equipment and/or off-road engines actually used may subject the Contractor to the consequences of noncompliance specified in Section 2510 of the Environment Code, including but not limited to the penalties prescribed therein. The assessment of penalties for noncompliance shall not preclude the City from exercising any other rights or remedies to which it is entitled.

END OF SECTION

ATTACHMENT C:

Maher Ordinance Screening Request

For a project to which you have been assigned as a Public Works project manager, complete the top of this form and submit to SAR, with plan showing the limits of excavation and of known Maher locations in the work area.

Project Name: _____ JO#_____ Date submitted:_____

Submitted by: _____ Date requested by (minimum of 20 working days): _____

Describe the general project scope, and give details of ground-disturbing activities:
Describe the project location(s). For work in parcels, provide street addresses. For work in the public right-of-way, provide street addresses for the beginning and ends of each street segment in which work will be done:
Estimated volume of excavated native material or earthen fill that the project will generate: _____ yd^3 — Does the project require a building or grading permit from DBI? Yes ☐ No ☐

FOR SITE ASSESSMENT & REMEDIATION USE

SA&R: Complete this section, initial, and forward to Project Manager and Regulatory Affairs Manager:

Date returned to PM:_____ Initial:_____ Date forwarded to RA:_____ Initial:_____

☐ Project does not meet excavation-volume threshold and/or intersect with a known Maher site. Maher does not apply.

☐ Project does not require a building or grading permit from the Department of Building Inspection. This includes all projects for the repair and replacement ("R&R") of existing structures in the public right-of-way for end-of-life replacement and/or to address structural inadequacies found during regular inspection. Per Health Code §22A.3 and Building Code §106A.2.4, the Maher Ordinance does not apply.

☐ Project does not require a building or grading permit and Maher does not apply, but the project will require construction specifications for protection for workers and the public, and for hazardous-materials handling and disposal to meet state and federal regulatory requirements. Please budget an estimated $_____ for specification development.

☐ Project requires a building permit and/or grading permit and will bring to the surface 50 or more cubic yards of native material or earthen fill. A Maher application is required. Please budget an initial $_____ in SFPH fees. We anticipate that the following will also be required:

- ☐ Site history (Phase I ESA).
- ☐ Phase II / Phase II workplan.
  - ☐ With site mitigation plan.
  - ☐ With site mitigation report/ Environmental inspection.

Recommended by:

Signature Print Name Date

To complete this form, you will need the following information:

You will need to know that approximate total amount of excavated earth and earthen fill your project will bring to the surface, both permanent excavation and excavation that later will be backfilled. The key to whether or not activities add to your Maher total is whether or not the material brought up is earth or earthen fill -- roadway base, for example, does not count -- and whether or not it is brought to the surface -- pile driving does not count, but the spoils of holes drilled for piles will.

The easiest way to arrive at an approximate total is to classify excavations by type. For example, your project may have 12 pole footings, and two linear trenches. Each footing requires excavation of an area approximately 5' x 5' to a depth of 5'. There are 12 of these, so 5' x 5' x 5' x 12 = 1,500 ft^3. For the trenches, one is 10' deep, 5' wide, and 40' long, and the other is 8' deep, 5' wide, and 20' long. This would be (10' x 5' x 40') + (8' x 5' x 20') = 2,800 ft^3. Together, the total excavation for Maher is about 150 yd3, which would go over the 50 yd^3 limit that triggers Maher screening.

You'll need to provide a brief description of your project. Provide a general scope of your project (whether it is a streetscape project, a building-rehabilitation project, etc.) and provide details on the construction activities that will disturb the soil. For example, discuss the pole footings and the excavation that will accompany their construction. Provide identifiable project location(s). If your project is on a parcel, give the project address. If the project is in the public right-of-way, give, at a minimum, the street addresses at the beginning and end of each street segment. If the project is on a large public parcel (such as a park/open space), give enough information so that the location can clearly be identified.

You will need to provide mapping of your excavations with the Maher mapping overlain in order to facilitate SAR's presentation of your project information to San Francisco Public Health (SFPH), who oversee Maher compliance. Present the layers of your plans that contain the bulk of your excavation activities, and overlay the Maher Map. Maher mapping in GIS and DWG form can be found on the Public Works GIS server at \\dpwhyd1\boe5m\sfGeology\MaherSitesAndBlocks. (You may have \\dpwhyd1\boe5m mapped as the K: drive.)

Email this mapping along with the filled-out (top section only) digital version of the PDF form to the Site Assessment and Remediation (SAR) section. SAR will respond (after a minimum of 20 working days) with an assessment of whether or not your project requires further action, and what this action will be.

SAR: Stanley DeSouza <stanley.desouza@sfdpw.org>
Regulatory Affairs: Boris Deunert <boris.deunert@sfdpw.org>

Attachment D - PAC

SAN FRANCISCO
PLANNING DEPARTMENT

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

San Francisco Public Works
Preliminary Archeological Checklist (PAC)

PART I - PROJECT INFORMATION:

Date:_____ **Public Works RA Staff:** _____

Project name: _____ **Case No:** _____

Application type: EE CatEx

Project address: _____

APN/Cross streets: _____

EP Planner:_____**EP Archeologist:** _____

Consultant Archeologist name/firm (if applicable):_____

1. PROJECT DESCRIPTION: (include description of construction methods, all potentially ground-disturbing activities including parking, staging, equipment and spoils storage, temporary and permanent work areas, utility lines)

2. POTENTIAL GROUND DISTURBANCE

Yes	No	Project Component
☐	☐	Excavation (basement, elevator, utilities, seismic retrofit, remediation, underground vaults, septic tank system, culverts, etc.) Maximum depth:

2. POTENTIAL GROUND DISTURBANCE (cont.)

☐	☐	Pipeline replacement or installation (specify cut and cover, directional drilling, pipe bursting, etc):
☐	☐	Tunnels, transport storage boxes
☐	☐	Bore pits, test pits
☐	☐	Shallow Building Foundation (Mat, Spread Footings, etc.) Depth:
☐	☐	Piles, piers, micropiles, pilings, piling replacement
☐	☐	Grading, scraping
☐	☐	Demolition
☐	☐	Construction staging, spoils on unpaved area, fill
☐	☐	Road construction
☐	☐	Geotechnical trenching (dimensions)_____
☐	☐	New rip rap
☐	☐	Wharf or seawall modification
☐	☐	Other (specify):

Anticipated maximum extent of project ground disturbance:
Vertical_____Horizontal_____
APE Map Attached Y N

3. PREVIOUS SOILS DISTURBANCE AT PROJECT SITE:
Has the project site been previously disturbed by any of the following?

Yes	No	**Component of disturbance**
☐	☐	Existing Basement Depth:_____ Area:_____
☐	☐	Existing Foundation (footings, perimeter, piles, micropiles, etc.) Depth:
☐	☐	Site remediation/UST installation or removal, other excavation. Depth:
☐	☐	Site Grading
☐	☐	Demolition
☐	☐	Dredging
☐	☐	Piling installation (width and depth of trench):_____
☐	☐	Riprap
☐	☐	Seawall construction
☐	☐	Other (specify):

4. Has the entire project area previously been disturbed to the maximum depth and extent of proposed project disturbance? Y N
(Attach documentary evidence such as plans and profiles of prior trenching, utility street occupancy, historic photos, specifications from prior projects, etc.)
List attachments provided:_____
_____

☐ **Complete prior disturbance adequately documented. No further archeological assessment is required. EP Archeologist Concurs:** _____

☐ **Prior ground disturbance is unknown or cannot be adequately documented; Part II Required.**

PART II - ARCHEOLOGICAL DATA ASSESSMENT

1. ARCHIVAL AND DATA REVIEW

Dates of review:_____

Resources reviewed:

- ☐ Maher zone maps. Dates/ origin/ depth of fill if known_____
- ☐ Geotechnical data for project site and vicinity. Report_____
- ☐ EP Archeological GIS maps (all layers or specify applicable layers)_____

_____

- ☐ Sanborn Insurance maps (1887-93, 1899-1900)
- ☐ U.S. Coast Survey maps (1853, 1857, 1869)
- ☐ Information Center archeological records search (attach request and response)
- ☐ NAHC Sacred Lands File
- ☐ Native American/ Ethnic group consultation
- ☐ Other:_____
- ☐ Historical Maps or other information provided by Public Works

2. ARCHEOLOGICAL FIELD INVENTORY

- ☐ Not warranted; no exposed ground surface in project area
- ☐ Results negative
- ☐ Results positive
- ☐ Survey results inconclusive

Archeologist/ Firm_____ Date of Survey_____

Attach Archeological Survey Report/Memo; may combine with results of archival review.

3. SUMMARY OF RESULTS OF PROJECT ASSESSMENT

Site History/Formation:

Recorded/documented archeological sites/ investigations on/in the vicinity of the project site:

4. CONCLUSIONS AND RECOMMENDATIONS

a) NO EFFECTS TO ARCHEOLOGICAL RESOURCES EXPECTED:

☐ Project effects limited to previously-disturbed soils Project effects limited
☐ to culturally sterile soils
☐ Based on assessment above, no potentially CEQA-significant archeological resources are expected within project area affected soils.

b) AVOIDANCE AND TREATMENT MEASURES NECESSARY TO AVOID AN ADVERSE EFFECT TO SIGNIFICANT ARCHEOLOGICAL RESOURCES:

☐ Discovery: potential to adversely affect archeological resources; may be avoided by implementation of **Public Works Standard Archeological Measure I** (Discovery during Construction), with implementation of Standard Archeological Measures II (Monitoring) and/or III (Testing/ Data Recovery) in the event of a discovery during construction.

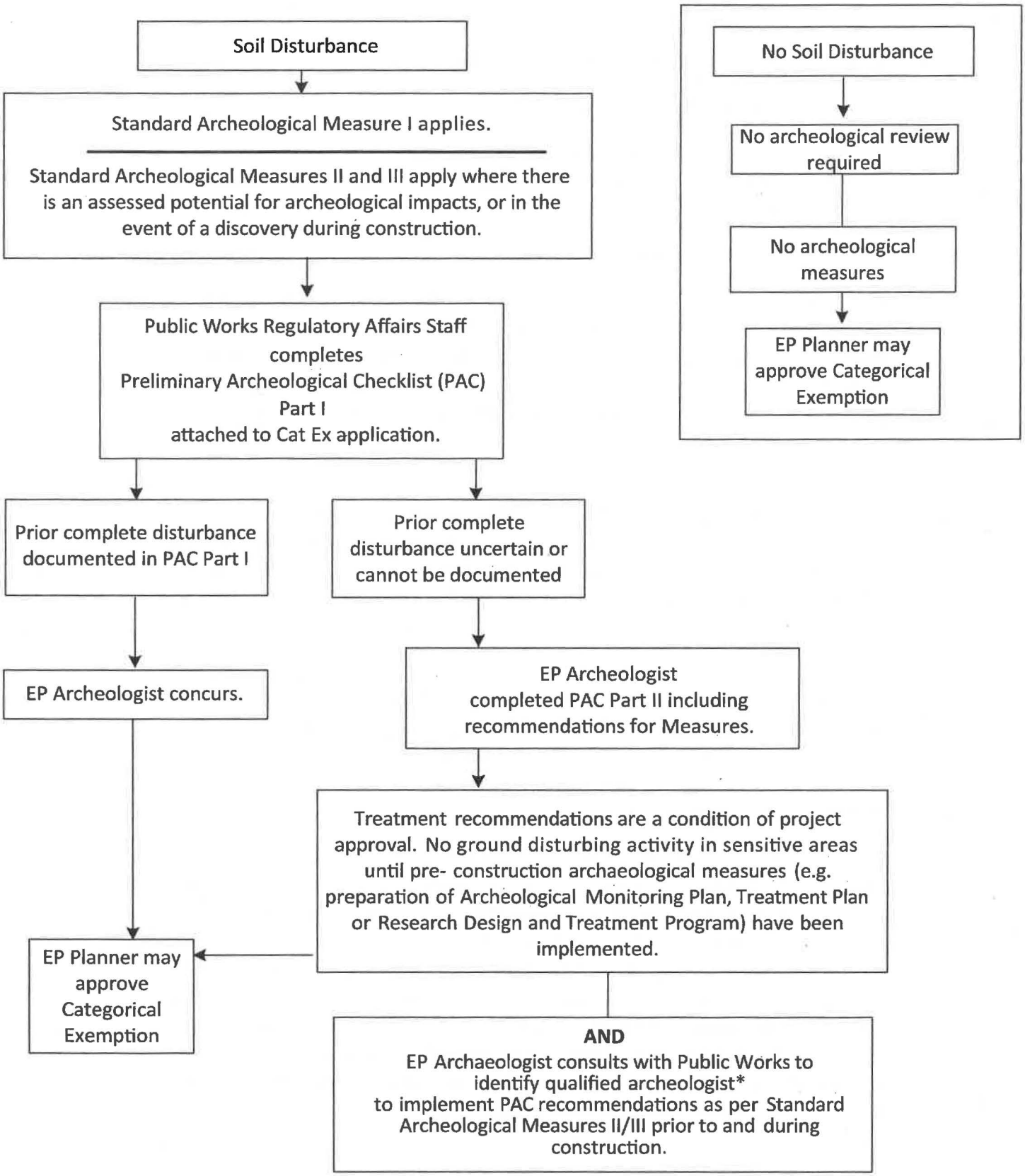
☐ Monitoring: some potential for the project to adversely affect archeological resources; may be avoided by implementation of **Public Works Standard Archeological Measure II** (Archeological Monitoring) during construction.

☐ Testing/Data Recovery: potential of the project to adversely affect archeological resources; may be avoided by implementation of **Public Works Standard Archeological Measure III** (Archeological Testing/Data Recovery)

Implementation Require:
prior to or during construction.

☐ CEQA evaluation of the project requires preparation and implementation of an archeological research design and treatment plan (ARDTP) by a qualified archeological consultant. See attached scope of work for the ARDTP

Attachment E:
Public Works Standard Construction Measure #9 Archeological Assessment Process



* Archeologist or archeological consultant who meets the Secretary of the Interior's Professional Qualifications Standards (36 CFR 61) as defined in Standard Archeological Measure I.

Attachment F: Public Works Archeological Measure I (Archeological Discovery)

The following requirements are applicable to:

- All projects that will include soil disturbance,
- Any discovery of a potential historical resource or of human remains, with or without an archeological monitor present.

Prior to ground disturbing activities:

A. Alert Sheet. Public Works shall, prior to any soils disturbing activities, distribute the Planning Department archeological resource "ALERT" sheet to each project contractor or vendor involved in project-related soils disturbing activities; ensure that each contractor circulates it to all field personnel; and provide the Environmental Review Officer (ERO) with a signed affidavit from each contractor confirming distribution to all field personnel.

Upon making a discovery:

B. Work Suspension. Should a potential archeological resource be encountered during project soils disturbing activity, with or without an archeological monitor present, the project Head Foreman shall immediately suspend soils-disturbing activities within 50 feet (15 meters) of the discovery in order to protect the find from further disturbance, and notify the Public Works Project Manager (PM) and/or environmental planning staff, who shall immediately notify the ERO for further consultation.

C. Qualified Archeologist. All archeological work conducted under this measure shall be performed by an archeologist who meets the Secretary of the Interior's Professional Qualifications Standards (36-CFR 61); consultants will be selected in consultation with the ERO and meeting the criteria or specialization required for the resource type as identified by the ERO in a manner consistent with Public Works's on-call contracting requirements.

D. Assessment and Additional Measures. If the ERO determines that the discovery is a potential archeological/historical resource, the archeologist, in consultation with the ERO, shall document the find, evaluate based on available information whether it qualifies as a significant historical resource under the CEQA criteria, and provide recommendations for additional treatment as warranted. The ERO will consult with Public Works and the qualified archeologist on these recommendations and may require implementation of additional measures as set forth below in Archeological Measures II and III, such as preparation and implementation of an Archeological Monitoring Plan, an Archeological Testing Plan, and/or an Archeological Data Recovery Plan, and including associated research designs, descendant group consultation, other reporting, curation, and public interpretation of results.

E. Report Reviews. All plans and reports prepared by an archeological consultant, as specified herein, shall be submitted first and directly to the ERO for review and comment with a copy to the Public Works and shall be considered draft reports subject to revision until final approval by the ERO.

F. Draft and Final Archeological Resources Reports. For projects in which a significant archeological resource is encountered and treated during project implementation (see Archeological Measures II and III), the archeological consultant shall submit a draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken, research questions addressed, and research results. Information that may put at risk any archeological resource shall be provided in a separate, removable insert within the draft final report.

Once approved by the ERO, copies of the FARR shall be distributed as follows: two copies to the applicable California Historic Information System Information Center (CHRIS), one copy to each descendant group involved in the project, and documentation to the San Francisco Planning Department of transmittal of the above copies. In addition, the Planning Department shall be provided one bound, one unbound and one unlocked, searchable PDF copy on CD of the FARR, which shall include copies of any formal site recordation forms (CA DPR 523 series) and/or National Register of Historic Places/California Register of Historical Resources nominations.

G. Other Reports. In instances of high public interest or interpretive value, the ERO may require different or additional final report content, format, and distribution than that presented above.

H. Human Remains, Associated or Unassociated Funerary Objects. Public Works shall ensure that human remains and associated or unassociated funerary objects discovered during any soils disturbing activity are treated in compliance with applicable State and federal laws. In the event of the discovery of potential human remains, the construction contractor shall ensure that construction activity within 50 feet of the find is halted and the Public Works PM, ERO, and the County Coroner are notified immediately. If the Coroner determines that the remains are of Native American origin, he/she will notify the California State Native American Heritage Commission. Subsequent consultation on and treatment of the remains shall be conducted consistent with Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(d), in consultation with the ERO.

I. Consultation with Descendant Communities. Consistent with AB 52 requirements, if requested, Public Works shall provide opportunities for Native American descendant groups to provide input during project planning for projects that may affect potential Tribal Cultural Resources. In addition, on discovery during construction of an archeological site associated with descendant Native Americans, the Overseas Chinese, or other descendant group, an appropriate representative of the descendant group shall be contacted by Public Works at the direction of the ERO. Public Works will offer this representative the opportunity to monitor archeological field investigations of the site and to consult with the ERO regarding the appropriate treatment and, if applicable, interpretation of the site and the recovered materials.

J. Construction Delays. Archeological monitoring and/or data recovery programs required by this measure may suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if this is the only feasible means to reduce potential effects on a significant archeological find to a less-than-significant level.

Attachment G. Public Works Archeological Measure II (Archeological Monitoring)

A. Archeological Monitoring Plan (AMP). Where an archeological field investigation to identify expected buried or submerged resources cannot reasonably be carried out during project planning/ environmental review (for example, where definitive determination would require extensive street opening prior to construction), prior to any project-related soils-disturbing activities the qualified archeologist identified under Archeological Measure I.C. shall consult with Public Works and the ERO to develop an Archeological Monitoring Plan (AMP). The AMP which will be implemented in conjunction with soil-disturbing activities during construction. Preparation and implementation of an AMP also may be required based on the results of pre-construction archeological testing or upon a discovery during construction.

The AMP shall include the following elements, at minimum:

- Historical context and research design for assessment of resource types likely to be encountered;
- Project activities to be archeologically monitored and intensity of monitoring of each type and location of project construction activity; and
- Procedures for the documentation, significance and integrity assessment, treatment, interpretation and reporting of the types of resources likely to be encountered.

B. Reporting. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO at the end of construction (See Archeological Measure I.E [Report Reviews] and I.F. [Draft and Final Archeological Research Report]).

C. Monitoring Authorities

- The archeological monitor will have the authority to halt construction activity at the location of a suspected resource for inspection, documentation, and assessment of the need for further measures as set forth in Archeological Measure III.
- The Archeological Monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis.
- The Archeological Monitor(s) shall be present on the project site according to a schedule identified in the AMP, subject to modification upon ERO concurrence, based on findings.

D. Testing/Data Recovery. In the event of a discovery during construction, if the ERO and archeological consultant determine that the discovery is a significant resource (that is, a

resource that meets the eligibility criteria of the California Register of Historic Resources or qualifies as a unique archeological resource) that will be adversely affected (that is, where the project would result in loss of data potential) or that additional investigation is required to make this determination, all applicable elements of Archeological Measure III (Archeological Testing/Data Recovery) also shall be implemented.

Attachment H. Public Works Archeological Measure III (Testing / Data Recovery)

The following provisions apply prior to or during construction when a significant archeological resource (as defined in Measure II.D) or an archeological resource of undetermined significance is expected to be present in the work area and the ERO, in consultation with the qualified archeologist, determines that an archeological field investigation is needed to determine: a) the presence of an archeological resource, b) whether it retains depositional integrity, and c) whether it qualifies as a legally significant resource under CEQA criteria. All archeological work under this Measure will be carried out by a qualified archeologist as identified in Archeological Measure I.C. Per Archeological Measure I.J, implementation of this measure shall not exceed four weeks except at the direction of the ERO and only if this is the only feasible means to reduce potential effects on a significant archeological find to a less-than-significant level.

A. Archeological Testing Program. If an archeological investigation is required in order to verify resource location and/ or assess the significance of the resource, the archeological consultant shall consult with the ERO to prepare and implement an Archeological Testing Plan (ATP) that identifies:

- Key research questions and associated data needs,
- Testing/ sampling methods, and
- Testing locations.

Results of testing shall be presented to ERO in a written report following Measure I.E. If, based on the archeological testing program, the archeological consultant finds and the ERO concurs that significant archeological resources may be present, Measures III.B and/or III.C below will be implemented.

B. Treatment. If the project could adversely affect a significant (CRHR-eligible) archeological resource, preservation in place is the preferred manner of mitigating impacts, as detailed in CEQA Guidelines 15126.6(b) (3)(a) and (b).

If preservation in place is determined to be infeasible, the Public Works at its discretion shall either:

- Re-design the proposed project so as to reduce the adverse effect to a less-than-significant level through preservation in place or other feasible measures; and/or
- For a resource important for its association with an important event or person, or which is of demonstrable public interest for both its scientific and historical values (e.g., a submerged ship), and where feasible, preserve the resource in

place with appropriate documentation; or, if not feasible to preserve in place, systematically document and/or recover for interpretive use, at the discretion of the ERO, and/or;

- For an archeological resource significant primarily for its data potential, design and implement an archeological data recovery program, as detailed under Measure III.D, below.

C. Archeological Data Recovery Plan (ADRP). For resources for which the elected treatment is archeological data recovery, the archeological consultant, in consultation with the ERO, shall prepare and implement an ADRP. It will identify how the significant information the archeological resource is expected to contain will be recovered and preserved. Data recovery results will be reported in the FARR, as detailed in Measure I.F. The ADRP shall include the following elements:

- Historic context and research design
- Field methods and procedures, including sampling strategy
- Archeological monitoring recommendations for ongoing construction
- Cataloguing and laboratory analysis
- Discard, deaccession, and curation policy
- Interpretive program
- Security measures

VIBRATION CONTROL PROCEDURES FOR INCLUSION IN CONSTRUCTION CONTRACTS

SECTION 01 35 51

VIBRATION CONTROL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes minimum provisions for compliance with City, state, and federal laws and regulations for vibration control, and notes to which Standard Construction Measure (SCM) the section refers.

1. Vibration Control (SCM-5).

B. Related Sections:

1. Section 00 41 00 Bid Form
2. Section 01 35 49 Minimum Environmental Procedures
3. Section 01 31 19 Project Meetings

1.2 REFERENCES

A. Refer to the following references:

1. Andrews, Jim, et al. Transportation and Construction Vibration Guidance Manual. California Department of Transportation Report No. CT-HWANP-RT-13-069.25.3, September 2013.

1.3 DEFINITIONS

A. For the purposes of this Section, the following definitions apply:

1. Historic buildings or historic structures: Buildings or structures labeled as historic structures on project plans.

1.4 SUBMITTALS

A. Contractor shall submit the following prior to the start of construction and prior to performing any vibration monitoring:

1. A record of laboratory calibration shall be provided for all vibration-monitoring instruments to be used on site. Certification shall be provided to indicate that the instruments are calibrated and maintained in accordance with the equipment manufacturer's calibration requirements and that calibrations are traceable to the U. S. National Institute of Standards and Technology (NIST). The record shall certify that all seismographs shall have been calibrated by the manufacturer or certified calibration laboratory within one year of their use on site.
2. Manufacturer's product data for all vibration-monitoring instruments to be used on site describing all specified vibration-monitoring instruments, together with product data and instruction manuals.
3. Documentation and photography of the properties that are the subject of the Vibration Monitoring Plan, as specified below in 3.4.G.

4. A written Vibration Monitoring Plan detailing the procedures for vibration monitoring. Such plan shall include:

   (a) The name of the Firm providing the vibration monitoring services.

   (b) Description of the instrumentation and equipment to be used.

   (c) Measurement locations and methods for mounting the vibration sensors.

   (d) Procedures for data collection and analysis.

   (e) A limiting value as applied in 3.4, below.

   (f) Means and methods of providing warning when a limiting value is reached.

   (g) Generalized plans of action to be implemented in the event the limiting values is reached. The generalized plans of action shall be positive measures by the Contractor to control vibrations (e.g. using alternative construction methods).

   (h) Procedures for post-construction assessment of any damage due to vibration during construction to historic buildings or structures susceptible to vibration in or adjacent to the project, and reporting requirements and procedures if such damage occurs.

5. Within 10 working days after the completion of the background vibration monitoring as described in 3.4.G, Contractor shall submit a hard copy report documenting the results of background vibration monitoring at each monitoring location.

B. Qualification Data: For firms and persons specified in subsection 1.5 "Quality Assurance" of this Section to demonstrate their capabilities and experience.

1.5 QUALITY ASSURANCE

A. Qualifications

1. Qualified Vibration Instrumentation Engineer: a registered Professional Engineer in the State of California, who has a minimum of a Bachelor of Science degree in civil engineering, and who has at least 4 years of experience in the installation and use of vibration-monitoring instrumentation and in interpreting instrumentation data.

B. Regulatory Requirements

1. All work shall comply with the following:
   (a) San Francisco Police Code, Article 29, Ordinance #274-72 ("Noise Ordinance")
   (b) San Francisco Public Works Code, Article 2.4 (“Excavation in the Public Right-of-Way”)
   (c) San Francisco Public Works Code Ordinance #175-91,Sections 1100-1107

C. The City will inspect and monitor Contractor's adherence to the requirements specified herein and will report on Contractor's compliance.

1. Said inspection, monitoring, and reporting activities may include, but are not limited to, qualitative, quantitative and photographic observations and data collection on the impacts of vibration.

2. Contractor shall cooperate with such inspection and monitoring activities, provide access to the Work site to establish and secure monitoring stations, and make its facilities and records available to the City for performing such monitoring.

3. The City will issue a Non-Compliance Notice to Contractor for any detected non-compliance with the provisions herein or of any environmentally objectionable acts and the corrective action to be taken.

1.6 SEQUENCING

A. Contractor shall submit a Vibration Control Plan to the City for review and approval at least 30 days prior to commencing construction.

B. Contractor shall notify the City Representative at least 24 hours prior to starting a new construction task potentially capable of exceeding the project's vibration Threshold Value.

1.8 DAMAGES FOR FAILURE TO MEET ENVIRONMENTAL REQUIREMENTS

A. The Contractor shall be liable for all fines, penalties, liquidated damages and costs arising from any failure to implement mitigation measures to control vibration impacts that are subject to Federal, State, and local regulatory fines.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials necessary for compliance with the Vibration Monitoring Program:

1. The seismograph(s) used as part of the program shall have the following minimum features:

(a) Seismic range: 0.01 to 4 inches per second with an accuracy of +5 percent of the measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inches per second or less.

(b) Frequency response (+3 dB points): 2 to 200 Hertz.

(c) Three channels for simultaneous time-domain monitoring of vibration velocities in digital format on three perpendicular axes.

(d) Two power sources: internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for up to 24 hours.

(e) Capable of internal, dynamic calibration.

(f) Direct writing to printer and capability to transfer data from memory to a secure digital memory card and/or USB mass storage device. Instruments must be capable of producing strip chart recordings of readings on site within one hour of obtaining the readings. Provide computer software to perform analysis and produce reports of continuous monitoring.

(g) Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of one minute or less.

PART 3 - EXECUTION

3.1 VIBRATION CONTROL

A. This subsection applies when trees, rock outcroppings, historic buildings, historic structures, or other resources or landscape features are shown on the project plans and are labeled as requiring a vibration-monitoring program.

B. Where the project includes or is directly adjacent to a resource susceptible to vibration, as shown on project plans, the Contractor shall institute a vibration-monitoring program to protect such properties from excess vibration during demolition and construction activities associated with the project.

C. The Contractor shall submit a Vibration Control Plan to the City for review and approval, to be fully implemented upon approval.

1. For purposes of this subsection, “limiting value” shall be:

   (a) For Vibration Control Plans for historic buildings or historic structures, 0.12 inches per second peak particle velocity (in/sec PPV) for sustained vibration (e.g. impact pile drivers, vibratory equipment) in any direction, unless a greater value is approved in writing by the City Representative.

   (b) For Vibration Control Plans for all other resources, 0.2 inches per second peak particle velocity (in/sec PPV) for sustained vibration (e.g. impact pile drivers, vibratory equipment) in any direction, unless a greater value is approved in writing by the City Representative.

2. The Contractor’s vibration-monitoring personnel shall include a Qualified Vibration Instrumentation Engineer approved by the City’s Representative. The Qualified Vibration Instrumentation Engineer shall:

   (a) Be on site and supervise the initial installation of each vibration-monitoring instrument.

   (b) Supervise interpretations of vibration-monitoring data.

3. Contractor shall collect seismograph data prior to any vibration-producing demolition or construction activities to document background vibrations at each monitoring location. The background monitoring shall be performed for a minimum of two non-consecutive workdays, spanning the hours during which demolition and construction activities will take place. Monitoring shall consist of a continuous recording of the maximum single-component peak particle velocities for one-minute intervals, which shall be printed on a strip chart.

4. Contractor shall have seismographs in place and functioning at least 24 hours prior to any such activity within 200 feet of the monitoring locations. No significant vibration-producing activity shall occur within this zone unless the monitoring equipment is functioning properly, as determined by the City Representative.

5. Contractor shall monitor vibration during demolition and other significant vibration-producing construction activities as determined by the City Representative. This monitoring shall consist of a continuous recording of the maximum single-component peak particle velocities for one-minute intervals, which shall be printed on a strip chart. During the monitoring, Contractor shall document all events that are responsible for the measured vibration levels, and submit the documentation to the City Representative with the data.

6. All vibration monitoring data shall be recorded contemporaneously and plotted continuously on a graph by the data acquisition equipment. Each graph shall show time-domain wave traces (particle velocity versus time) for each transducer with the same vertical and horizontal axes scale

7. The Contractor shall interpret the data collected, including making correlations between seismograph data and specific construction activities. The data shall be

evaluated to determine whether the measured vibrations can be reasonably attributed to construction activities

8. The equipment shall be set up in a manner such that an immediate warning is given when the peak particle velocity in any direction exceeds the Threshold Value in the previously submitted Vibration Monitoring Plan. The warning emitted by the vibration-monitoring equipment shall be instantaneously transmitted to the responsible person designated by Contractor by means of warning lights, audible sounds or electronic transmission.

9. If a Limiting Value is reached, the Contractor shall:

   (a) Immediately notify the City Representative and suspend activities in the affected area, with the exception of those actions necessary to avoid exceeding the Limiting Value.

   (b) Meet with the City Representative to discuss the need for response action(s).

   (c) If directed by the City Representative during the above meeting that a response action is needed, submit within 24 hours a detailed specific plan of action based as appropriate on the generalized plan of action submitted previously as part of the vibration-monitoring plan.

   (d) If directed by the City Representative, implement response action(s) within 24 hours of submitting a detailed specific plan of action, so that the Limiting Value is not exceeded.

10. Where the subject of the Vibration Monitoring Plan is a historic building or structure, Contractor shall engage a Qualified Historic Architect or Historic Preservation Professional to document and photograph the properties that are the subject of the Vibration Monitoring Plan to ensure structural damage does not result from construction activities that could cause ground vibration.

    (a) The post-construction survey and monitoring results will be evaluated to determine whether the new structural and/or architectural damage was caused by vibration due to Contractor's performance of this Work.

    (b) If, following completion of construction, changes in the architectural or structural conditions the properties that are the subject of the Vibration Monitoring Plan have occurred, Contractor shall restore the buildings to pre-construction conditions, and to the satisfaction of the City Representative.

END OF SECTION

DRAFT WATER AND AWSS PROTECTION PROCEDURES FOR INCLUSION IN CONSTRUCTION CONTRACTS

SECTION 01 41 28

PROTECTION OF EXISTING WATER AND AWSS FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION

A. Design and install temporary supports to work around the San Francisco Public Utilities Commission's (SFPUC) Potable Water (PW), Recycled Water (RW), and Auxiliary Water Supply System (AWSS) facilities to protect and provide uninterrupted service to these facilities. Contractor will be held responsible for any damage related to or caused by failure to exercise due care. Repair of existing utilities and improvements damaged during construction shall be at the Contractor's expense.

B. The Contractor shall furnish, install and remove upon completion of the work, Settlement Reference Points (SRP) and Settlement Monitoring Points (SMP) for the San Francisco Public Utilities Commission's (SFPUC) Auxiliary Water Supply System (AWSS) piping as shown on drawings and conduct the survey of SRPs and SMPs as specified hereinafter.

C. The Contractor shall perform all required work as stated in this specification section and as shown on the Drawing(s) and furnish all materials, other than those specified to be furnished by the City, which are necessary or required to complete the work.

1.02 RELATED SECTIONS

Not Used

1.03 RECORD DRAWINGS AND STANDARDS

Records of the existing PW, RW, and AWSS facilities and Standard requirements are available for examination by bidders/awarded Contractor at the SFPUC's City Distribution Division (CDD), Engineering Section, 1990 Newcomb Ave, San Francisco, CA 94124. Telephone number 415-550-4994.

Contractors are warned that changes which do not appear in the records for existing CDD facilities may have been made. The City makes no representation as to the completeness or accuracy of said records and assumes no responsibility thereto.

1.04 DEFINITIONS

A. Maximum Allowable Settlement: Level at which no further movement will be acceptable and if reached requires work to be halted until submittal and acceptance of a written plan detailing corrective actions and restorative measures.

B. Response Values: Predetermined values within the instrument range indicating different levels of response as specified herein.

C. Settlement Monitoring Point: A system of points along the alignment of the AWSS for monitoring vertical deformation (settlement or heave) at or near the ground surface using optical survey techniques.

E. Settlement Reference Point: A stable, fixed control point established at a surface structure above ground that is referenced during settlement monitoring point measurements to permit calculation of vertical movements.

1.05 REFERENCES

A. AWSS Standard Plans

Drawing No.	Title
HPL-5993 Ch. 3	AWSS Standard Details AWSS Settlement Point; 07/09/84
HPL-5993.1 Ch. 1	AWSS Settlement Point for Double Spigot; 05/16/83

B. AWSS Settlement Monitoring Drawings in the Contract showing approximate locations of settlement monitoring and reference points.

C. State of California Labor Code, Section 6705 and 6707.

D. State of California Construction Safety Orders, Article 6 - Excavation.

1.06 SUBMITTALS

Submit the following to City Representative for review:

A. Work plan, support details, and calculations.

1. Work Plan for working around existing PW, RW, and AWSS facilities. The plan shall show the locations of proposed facilities, existing utilities and pipelines, proposed pipe supports for SFPUC CDD facilities, pipe storage, spoil bank, excavation and pipe laying equipment, shoring system, and a description of how the work will proceed around the

existing SFPUC CDD facilities. Provide drawings that include dimensions to allow determining the distances of objects relative to the SFPUC CDD facilities. Sizes of existing and proposed facilities, width and depth of proposed trench, and any other pertinent information must be shown in the drawings. For proposed structural facilities, such as retaining walls, potentially impacting CDD facilities, submit elevation and or section views showing horizontal and vertical locations of CDD facilities relative to the proposed structure.

2. Where supports are required, submit support details and calculations, signed and stamped by a California licensed Civil or Structural Engineer, for structural support for the protection of all exposed and/or undermined sections of SFPUC CDD pipe or facilities. At the discretion of SFPUC CDD Engineering, revised support details and calculations may be required to be submitted if conditions vary significantly following excavation.

3. Submit minimum (7) days before planned excavation.

B. Control Density Fill (CDF) mix design where CDF is required per this Specification. Submit certified laboratory test results within the past 1-year that the mix proportions and materials comply with these Specifications.

C. Survey of Settlement Reference and Monitoring Points data: The Contractor shall submit elevations of all SMPs and SRPs (to be provided in “feet”) by a State of California licensed Land Surveyor in addition to deflection calculations for each pipe joint.

Data and calculations shall be submitted once prior to the start of construction, once a week during construction, once at the end of construction and final survey is completed, and when threshold values are exceeded as specified below. Pipe deflection angles and elevation readings calculated from SMPs and SRPs are to be tabulated in chronological order with all previous results for review and approval within 24 hours of the survey being performed.

PART 2 PRODUCTS

2.01 CONTROLLED DENSITY FILL

A. Materials shall conform to the following:

1. Cement: ASTM C150, Type II or V.

2. Aggregate: ASTM C33. Aggregate shall consist of fine aggregate with a maximum size of 1/4", free of clay, organics, and other deleterious

materials. Less than 10 percent by weight shall pass the No. 200 sieve, and material passing the No. 40 sieve shall be nonplastic as determined in accordance with ASTM D4318.

3. Water: Potable.

4. Pozzolans: ASTM C618, Class C fly ash. Class F fly ash and slag is not permitted.

5. Air entraining: ASTM C260. Air content shall not exceed 25 percent.

6. Admixtures: Shall not contain chloride ions and shall not cause delayed strength gain.

B. Mixes:

1. Performance requirement: proportioned to be free-flowing, self-consolidating, hand tool excavatable, low-shrink slurry.

2. Mix design requirement: The Contractor and its supplier shall determine the materials and proportions used to meet the requirements of the Specifications.

3. Strength: Unconfined compressive strength at 28 days shall be between 50 to 125 psi tested per ASTM D 4832.

4. Flowability: 6 to 9 inches when tested per ASTM C-143 or ASTM D 6103.

5. Cementitious Material: Portland Cement. Where pozzolans are used, pozzolans shall be limited to maximum 60% of the weight of cement.

2.02 AWSS SETTLEMENT REFERENCE AND MONITORING POINTS

A. AWSS Settlement Reference and Monitoring Well Covers

6-inch valve cover, H-20 load rated, cover similar to the San Francisco Water Department's 6-inch gate valve cover.

B. Required survey monitoring of AWSS facilities outside of trenches and/or excavations:

1. Refer to the AWSS Settlement Monitoring Drawing(s) for the minimum number of SMPs to be installed as part of the contract work; and

2. For trench/excavation crossing AWSS, the SMPs shall be located starting on the closest pipe bell near the edge of the trench and/or excavation and installed outward away from the trench and/or excavation; and

3. Rod, guide pipe, and monitoring well shall be per Drawings "HPL-5993" and/or "HPL-5993.1", which are attached to this specification section and shall be at the approximate locations as shown on the AWSS work contract drawing(s), which are included in the contract documents. The exact SRP and SMP locations shall be determined in the field and approved by the SFPUC CDD Representative.

C. Required monitoring of AWSS facilities inside of trenches and/or excavations:

1. Exposed AWSS pipe joints in trenches and/or excavations shall be identified as a SMP regardless of whether the joint is called out on the AWSS Settlement Monitoring Drawing(s) to be surveyed and monitored. Price for additional survey locations when required by the specifications and/or by the SFPUC CDD Representative shall be based on the Contractor's total bid price for SMPs divided by the quantity of SMPs as shown on the AWSS work drawing(s) to be installed, surveyed and removed. Field verification of the exact location shall be required and approved by SFPUC CDD Engineering.

2. Additional SMPs within trenches and/or excavations may be necessary on either or both sides of the AWSS joint to distinguish the difference between vertical displacement and joint deflection.

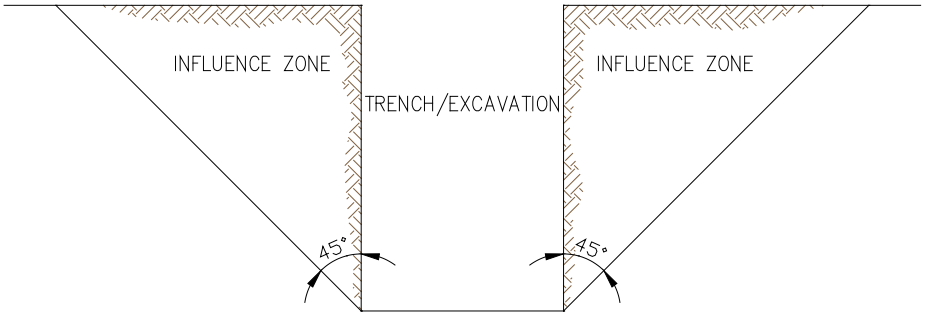
D. Placement of SRP(s) for survey monitoring of SMPs:

1. A settlement reference point shall be designated by a marking on a hydrant or other stable, permanent fixture located within the public right-of-way. The same location shall be surveyed for reference over the course of the project. Refer to the AWSS Settlement Monitoring Drawing(s) for the minimum number of SRP(s) to be installed as part of the survey monitoring work.

PART 3 EXECUTION

3.01 SUPPORT OF EXISTING PW, RW, AND AWSS FACILITIES

A. Inspection, Review and Approval of Methods



1. If existing SFPUC CDD facility, not shown on the drawing or is shown on the drawing outside of the influence zone, is found to be within the influence zone of the proposed trench/excavation as shown in the figure above, the Contractor is required to contact CDD Engineering and request an inspection to review and approve the field methods being used and/or proposed for the protection of CDD facility. CDD Engineering reserves the right to require the Contractor to implement protection methods, such as placement of steel plates over AWSS or water facilities, additional shoring and pipe supports, use of hand-digging, change shoring system around impacted CDD facilities, or other protective methods, as appropriate for full protection of the CDD facilities.

2. If two or more consecutive SFPUC CDD lead filled, cast-iron pipe joints are located within the trench/excavation, CDD requires replacement of the existing pipe with new ductile iron pipe with elastomeric EPDM joint gaskets within the influence zone prior to excavating below the pipe.

3. Existing valves exposed in trench/excavation:

    a. If existing valve with lead filled joints will be exposed within the trench/excavation, CDD requires replacement of the existing valve and cast-iron pipe with new ductile iron pipe with elastomeric EPDM joint gaskets within the influence zone prior to excavating below the pipe as shown in the drawings.

    b. If existing valve with restrained elastomeric gasketed joints connecting to ductile-iron pipe will be exposed within trench/excavation, pipe support requirement shall be the same as that for ductile-iron pipe as specified in the following requirement. If valve is not restrained, restraints shall be added by CDD prior to excavating below the valve.

4. Pipe supports are required where CDD pipe is exposed more than:

    a. 6 ft. for cast-iron pipe with no exposed joint.

b. 3.5 ft. for cast-iron pipe with exposed joint.

c. 10 ft. for ductile-iron pipe with no exposed joint.

d. 6 ft. for ductile iron pipe with exposed joint(s).

5. Sheet pile driving adjacent to existing CDD pipe shall maintain a minimum clear spacing between back of sheet pile and edge of pipe of:

a. 1.5 ft. for ductile iron pipes.

b. 4 ft. for cast-iron pipes. If within 4 ft., settlement monitoring is required for both LPW and AWSS lines. Settlement monitoring of LPW lines shall be the same as for AWSS lines unless approved otherwise by CDD Engineering.

6. Main disconnection/reconnection, and valve replacement work for PW and RW shall be performed by SFPUC CDD. Excavation, backfilling, pipe laying, paving, traffic control, permitting, and any other support work necessary for the PW and RW replacement work shall be the Contractor's responsibility. All AWSS replacement work shall be performed by Contractor or subcontractor qualified by CDD to perform AWSS main installation. All replacement valves and piping for CDD replacement is supplied by CDD.

7. Provide details and calculations for structural support for the protection of exposed and/or undermined sections of SFPUC CDD facilities. Details and calculations shall be signed and stamped by a California licensed Civil or Structural Engineer. Structural supports shall be designed to protect (1) AWSS pipes constructed with Class H cast iron lead jointed pipe operating at 350 psi static pressure, (2) AWSS pipes constructed with Class 56 ductile iron pipe, (3) PW pipes constructed with Class B cast iron lead jointed pipe operating at 150 psi static pressure, and (4) PW or RW pipes constructed with Class 53 ductile iron pipe operating at 150 psi static pressure. Maximum deflection in pipe support members shall not exceed L/500, where L is the unsupported length of the member.

B. Restoration of Facilities

If project work exposes CDD facilities, the Contractor is required to

1. backfill and compact in compliance with San Francisco Department of Public Works (SFDPW) Street Excavation Code or as required by SFPUC CDD; and

2. perform soil compaction testing for backfill material placed within three (3) feet, horizontally or vertically, from the outside edge of a water facility, with all test results furnished to CDD Engineering.

For excavations that expose more than four (4) feet of CDD facilities or pipe joint (4-inch and smaller pipes are excluded), backfill is required to be constructed with control density fill (CDF) material. CDF material shall be free of organic materials and other deleterious substances. The CDF material shall have produced 28 days unconfined compressive strength from 50 pounds per square inch (psi) to a maximum of 100 psi and shall contain aggregate no larger than 3/8" top size with the 3/8" aggregate comprise less than 30% of the total aggregate content.

CDF material shall begin at one (1) foot above the top of any utility crossing under a CDD facility and continue up to the bottom of the CDD facility. CDF material shall not extend beyond the spring-line of any CDD facility. Width of CDF backfill shall be OD of CDD pipe + 1ft on each side.

3.02 INSTALLATION OF AWSS SETTLEMENT REFERENCE AND MONITORING POINTS AND SUPPORT OF PIPE

A. Installation

The SRPs and SMPs shall be installed prior to the start of construction work requiring excavation around AWSS pipe.

For SRPs at fire hydrants, the contractor shall select the top center of fire hydrant. The contractor must ensure that the exact same point is used to establish survey control prior to monitoring of SMPs and additional SRPs.

For installation of SMPs outside of trench/excavations, the Contractor shall expose the bell of the pipe so that the position of the guide pipe on the bell can be visually verified before backfilling. The installation method used shall not cause the guide pipe to move from its intended position.

For installation of SMPs inside of trench/excavations, the Contractor shall verify the leveling rod is positioned on top of the pipe by verifying the pipe crown with a level vial and marking the exact location on the pipe to ensure consistent monitoring of the same point.

The correct positioning of each SRP and SMP on the top of the pipe bell shall be verified and approved by a CDD Representative by visual inspection. To request an inspection by a CDD Representative, please contact CDD Engineering a minimum of five (5) business days in advance to schedule the inspection.

It is the responsibility of the Contractor to maintain all SRP and SMP installations in working order at all times.

The Contractor shall contact CDD Engineering to perform a "drop test" before installation of SMPs or SRPs to determine the ability of the pipe to maintain pressure. The CDD Representative will isolate the AWSS line during the installation of SMPs and SRPs and reactivate the line after the construction of the SMPs and SRPs is completed by the Contractor. To request a drop test by a CDD Representative, please contact CDD Engineering a minimum of five (5) business days in advance to schedule the test.

B. Removal

The SMPs and SRPs shall be removed by the Contractor, including pipe guides, monitoring well frames and covers and the roadway restored to its original condition(s).

C. Survey of Settlement Reference and Monitoring Points

1. The Contractor shall obtain elevations of all SMPs and SRPs, by a State of California licensed Land Surveyor.

2. Initial Survey: Record the elevations within an accuracy of 0.005 feet (1/16-inch) for each settlement monitoring point on all surveys. After completion of each instrument installation, take 3 sets of verification data readings for each instrument to demonstrate the adequacy of the installation, to demonstrate the proper operation and precision of the instrument, and to establish an initial value. Differential Leveling and Total station accuracy shall comply with the accuracy standard specified in Caltrans Second Order Differential Leveling Specifications and Second Order (Vertical) TSSS Survey Specifications respectively. If differential leveling survey method is used, a collimation (Two-Peg) test shall be performed to ensure accuracy within 0.003 feet prior to each survey run. Submit the initial readings to the City Representative.

3. Monitoring Schedule: Take readings of all SMPs and SRPs prior to the start of construction, once after the construction work is completed, and a final time a week after all construction work is completed. Intermediate monitoring frequency during construction shall as a minimum comply with the following:

Monitoring Frequency During Sheet Pile Driving	Monitoring Frequency During Excavation or Backfill	Monitoring Frequency in or Around Open Trench	Monitoring Frequency Away from Open Trench
Daily[1]	Daily[2]	3 Days[3]	Once[4]

Notes:

1 For SMP's within 25 ft. of pile driving, monitor daily if pile installation using vibratory hammer and every four hours if pile installation using impact hammer.

2 Daily for SMPs within 25 ft. of a trench section being actively excavated or backfilled.

3 Once every three days for SMPs within 25 ft. of an open trench after excavation is completed and utilities are being installed.

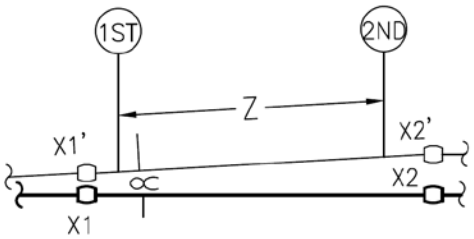
4 Once after trench within 25 ft of SMP is completely backfilled unless directed otherwise by the City Representative.

4. Elevation readings from SMPs and SRPs are to be tabulated in chronological order with all previous results and sent to CDD Engineering for review and approval within 24 hours of the survey being performed. Measurements shall be provided in "feet". Provide a plot of measured values versus time, including a time history of construction activity likely to influence such readings.

D. Response Values and Required Actions

1. The Maximum Allowable Settlement shall not result in any joint deflecting more than 1/4 degrees, where the deflection angle is calculated using this equation:

$$\propto \text{Tan}^{-1} \frac{(X1 - X1') - (X2 - X2')}{Z}$$



$\propto$ = DEFLECTION ANGLE IN DEGREES
$x1$ = INITIAL READING OF 1ST SMP
$x1'$ = CURRENT READING OF 1ST SMP
$x2$ = INITIAL READING OF 2ND SMP
$x2'$ = CURRENT READING OF 2ND SMP
z = DISTANCE BETWEEN SMPs

2. The response values are measured as a percentage of the Maximum Allowable Settlement. The Contractor shall abide by the following Response Values.

Threshold Value	Contractor Response Value	Shutdown Value
50%	80%	100%

3. When a given response value is reached, the Contractor shall provide written notice within the specified time and respond in accordance with the following:

   a. Threshold Value: The Contractor shall provide written notice within 24 hours of occurrence and meet with the City Representative within 24 hours of providing notice to discuss his means and method to determine what changes, if any, shall be made to better control ground movement. Instrument readings shall be required on a daily basis, unless instructed otherwise, until five consecutive working days of readings do not worsen the settlement by more than 5% of the Maximum Allowable.

   b. Contractor Response Value: The Contractor shall provide written notice and meet with the City Representative within 24 hours to discuss his means and method to determine what changes shall be made to better control ground movement. The Contractor shall actively control ground movement in accordance with the approved plan to prevent reaching the Shutdown Value:

   c. Shutdown Value: Contractor shall stop all work immediately and provide written notice within one hour upon occurrence. The Contractor shall meet with the City Representative to develop a plan of action before the work can be resumed. A drop-test will be performed by CDD prior to continuation of work.

E. Arrangement with Utility Companies

The Contractor shall make all necessary arrangements with the public service utility companies and obtain all necessary permits for any work or alteration of facilities as may be required due to the above described work.

E. Street and Sidewalk Restoration

Sidewalk and pavement restoration shall include the replacement of traffic lane(s) and crosswalk stripes, parking stall markings, and curb painting that might be obliterated during the installation/removal of the SRPs and SMPs construction.

F. Expose, Test, Realign, and Repair of AWSS Facilities

1. Requirement of Repair Work

Should readings from any two sets of surveys indicate a change in deflection at or exceeding the Shut Down Value, the Contractor shall stop all construction work in the vicinity of the AWSS facilities until the AWSS facilities have been inspected, repaired, if necessary, and the CDD Representative authorizes the Contractor to resume construction work.

If the CDD Representative determines that repairs are required, the Contractor will be responsible for preparing and restoring the site(s) for repairing the damaged joint(s). Repair of damaged joint(s) shall be done by CDD at Contractor's expense.

Site preparation and restoration will include

a. Contractor shall submit for review and approval by CDD Engineering, structural plans and details for the support and protection of AWSS facilities in the vicinity during repair of the damaged joint;

b. Contractor shall support and protect AWSS facilities per approved submittal(s);

c. Contractor shall excavate a trench as required by CDD Engineering to expose the damaged AWSS pipe joint for repair purposes;

d. Upon direction and approval from a CDD Representative, Contractor shall remove support and protection devices, and restore facilities as described in this Section; and

e. CDD Representative shall inspect and approve all site preparation and restoration for AWSS joint repair work.

2. Contractor Responsible for all Costs

Exposure and restoration, testing, realignment, replacement, and repair of existing AWSS facilities as described in this Section including furnishing of materials, labor, equipment including pump and tools necessary, or required, to do such work shall be at the expense of the Contractor.

The Contractor shall be responsible for all CDD labor and material costs associated with repairing the damaged AWSS facilities.

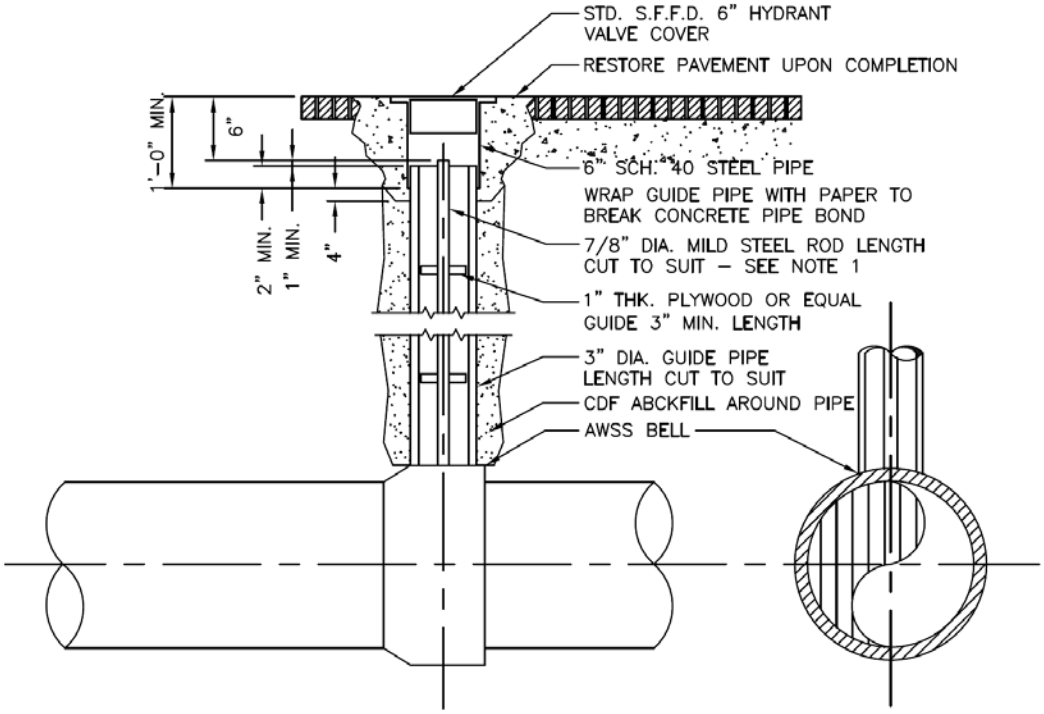
3. Testing

The Contractor is hereby notified that change in deflection of an AWSS pipe joint will require all the joints between two adjacent SRPs (on each side of the surveyed joint) to be exposed and realigned to the original alignment. The realignment of the pipe shall require CDD to isolate the pipe by closing gate valve(s), testing the aligned pipe at a pressure of 350 psi (or other pressure designed by the CDD Engineer), repair any joints showing leakage or lead extrusions, and reactivating the pipe.

A CDD Representative will witness all pressure tests when performed by the Contractor where alignment of the pipe is not required. The Contractor shall inform CDD Engineering a minimum of five (5) business days before all tests.

NOTES:

1. THE CONTRACTOR SHALL REPORT THE LENGTH OF THE ROD TO THE NEAREST HUNDREDTH OF A FOOT TO THE CITY.
2. PLYWOOD SHALL BE PRESS FIT TO THE 7/8"ø STEEL ROD AND SHALL FLOAT IN THE GUIDE PIPE.
3. MONITORING HOLE COVER AND FRAME ASSEMBLIES SHALL BE RATED FOR H-20 LOADING.
4. CONTRACTOR SHALL RESTORE ROADWAY TO (E) CONDITIONS UPON COMPLETION OF SURVEY WORK.



CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO WATER DEPARTMENT

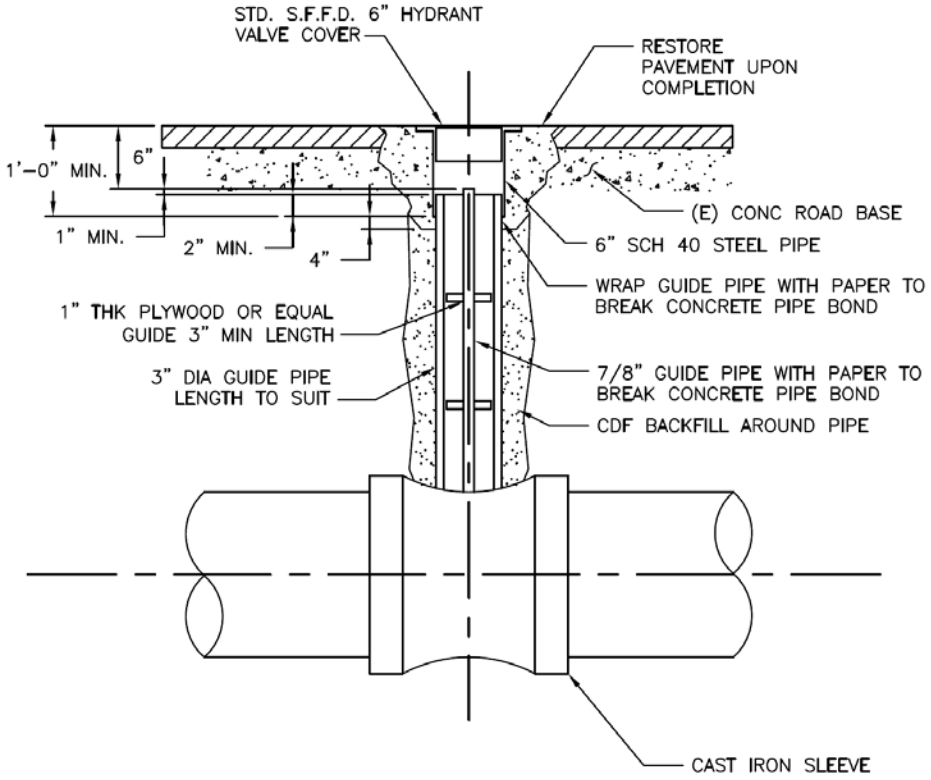
AUXILIARY WATER SUPPLY SYSTEM - STANDARD DETAILS

AWSS SETTLEMENT MONITORING POINT FOR BELL AND SPIGOT PIPE

	BY: DOUG LEE	DR: GLORIA CHU	DRAWING NO.
APPROVED: SAM YOUNG	CH: THANH NGUYEN	SCALE: NONE	HPL-5993
CDD MANAGER: KATIE MILLER	DATE: 01/2015	VERSION:	

NOTES:

1. THE CONTRACTOR SHALL REPORT THE LENGTH OF THE ROD TO THE NEAREST HUNDREDTH OF A FOOT TO THE CITY.
2. PLYWOOD SHALL BE A PRESS FIT TO THE 7/8"ø STEEL ROD AND SHALL FLOAT IN THE GUIDE PIPE.
3. MONITORING HOLE COVER AND FRAME ASSEMBLIES SHALL BE RATED FOR H-20 LOADING.
4. CONTRACTOR SHALL RESTORE ROADWAY TO (E) CONDITIONS UPON COMPLETION OF SURVEY WORK.



CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO WATER DEPARTMENT

AUXILIARY WATER SUPPLY SYSTEM -- STANDARD DETAILS

AWSS SETTLEMENT MONITORING POINT FOR DOUBLE SPIGOT PIPE

	BY: DOUG LEE	DR: GLORIA CHU	DRAWING NO.
APPROVED: SAM YOUNG	CH: THANH NGUYEN	SCALE: NONE	HPL-5993.1
CDD MANAGER KATIE MILLER	DATE: 01/2015		

END OF SECTION

APPENDIX D

Historic Architectural Resources Evaluations

Appendix D-1: VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, CA, October 2, 2017.

Appendix D-2: San Francisco Planning Department, Historic Resources Evaluation Response, Part 1, 2500 Mariposa Street, September 25, 2020.

Appendix D-3: San Francisco Planning Department, Historic Resources Evaluation Response, Part 2, 2500 Mariposa Street, September 25, 2020.

Appendix D-1

VerPlanck Historic Preservation Consulting, Historic Resource Evaluation, Potrero Trolley Coach Division Facility, 2500 Mariposa Street, San Francisco, CA, October 2, 2017.

HISTORIC RESOURCE EVALUATION

Potrero Trolley Coach Division Facility

2500 Mariposa Street

San Francisco, California

October 2, 2017

Prepared by

[redacted] VerPlanck

HISTORIC PRESERVATION CONSULTING

TABLE OF CONTENTS

I. Introduction

VerPlanck Historic Preservation Consulting prepared this Historic Resource Evaluation (HRE) for the San Francisco Municipal Transportation Agency (SFMTA). Its subject is the Potrero Trolley Coach Division maintenance/operations facility at 2500 Mariposa Street, in the Potrero District. The Potrero Trolley Coach facility is over 45 years old, making it a potential historical resource per Planning Department regulations. The Potrero Trolley Coach Division facility occupies the entirety of Assessor Parcel 001, which is coterminous with Block 3971, a two-square-block property bounded by Mariposa, Bryant, 17th, and Hampshire Streets **(Figure 1)**. The western half of the property is a large bus yard designed for storing off-duty electric-powered trolley coaches and the eastern half contains a two-story, reinforced-concrete maintenance and operations facility, originally designed as a car barn, which is designed in the Renaissance Revival style. This HRE contains a detailed description of the property and the surrounding neighborhood, as well as an in-depth history of the property, documenting its original construction in 1915, its expansion to two stories in 1924, its conversion into a trolley coach facility in 1948-49, and all other subsequent notable alterations and events associated with the property. This report also includes a biography of the facility's designer, City Engineer Michael M. O'Shaughnessy, and a brief history of car barns and bus yards in San Francisco. This HRE concludes with an analysis of the property's eligibility for listing in the California Register of Historical Places (California Register), finding it individually eligible under Criterion 1 (Events), and Criterion 3 (Design/Construction), with a period of significance of 1915 to 1941.

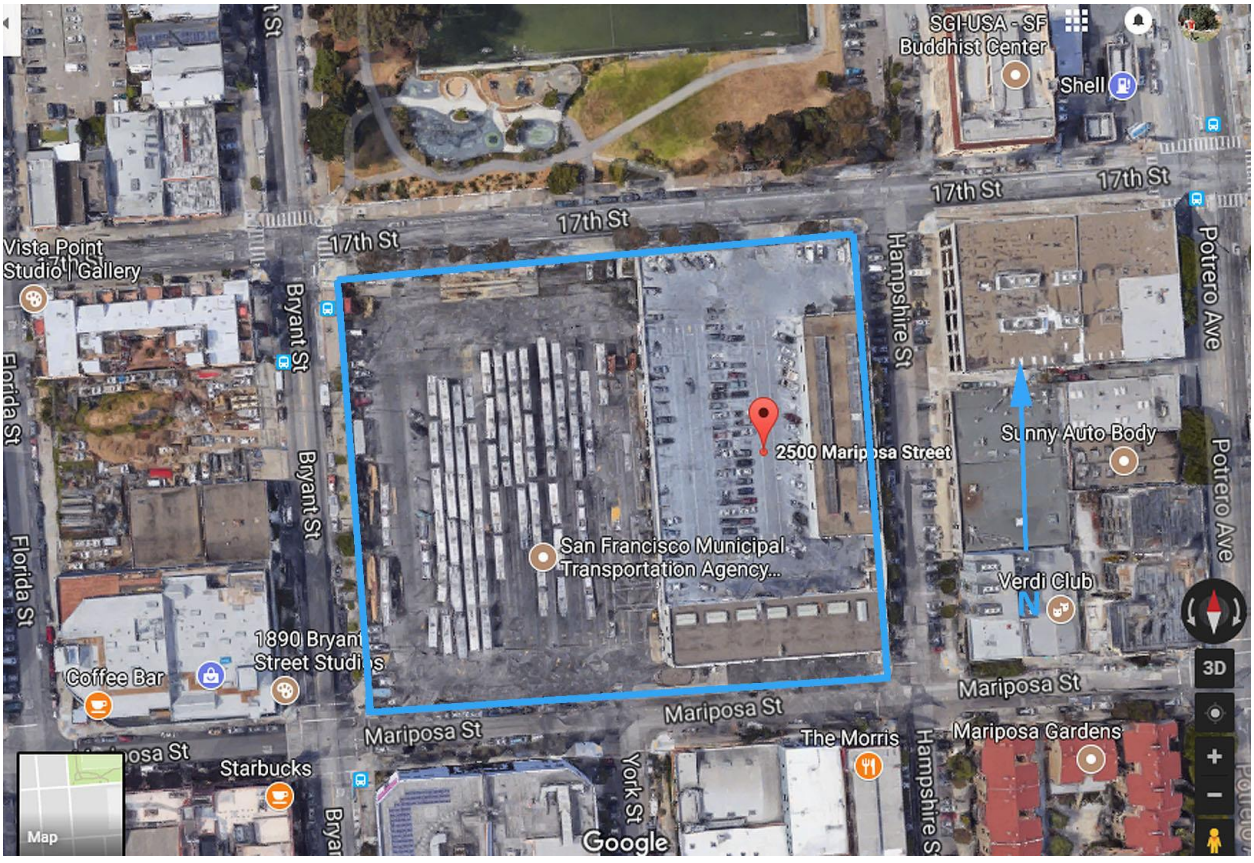


Figure 1. Map showing location of the Potrero Trolley Coach Division facility at 2500 Mariposa Street. Source: Google Maps; annotated by Christopher VerPlanck

II. Methods

Christopher VerPlanck, the author of this report, has 20 years of experience evaluating potential historical resources in San Francisco. In compliance with the San Francisco Planning Department's *CEQA Review Procedures for Historic Resources*, this HRE provides a description and a history of the Potrero Trolley Coach Division facility, as well as an analysis of the property's potential eligibility for the California Register. VerPlanck visited the property on June 21, 2017 to survey and photograph it and the surrounding neighborhood. Over the following two weeks, VerPlanck conducted primary research at government offices, libraries, and private repositories, including the San Francisco Office of the Assessor-Recorder, the San Francisco Department of Building Inspection, San Francisco Architectural Heritage, the San Francisco Public Library, the SFMTA Photography Department and Archive, and the California Historical Society. This HRE follows an outline approved by the San Francisco Planning Department on June 14, 2017.

III. Regulatory Framework

VerPlanck Historic Preservation Consulting searched federal, state, and local records to determine the property's zoning and to see if the Potrero Trolley Coach Division facility had been identified in any cultural resource surveys, or if it is listed in an official historic resource inventory. The specific surveys and registers consulted are described below.

A. Zoning and Height and Bulk Districts

The Potrero Trolley Coach Division maintenance/operations facility is located in the P-Public zoning district and a 65-X height and bulk district.

B. Here Today Survey

Published in 1968 by the San Francisco Junior League, *Here Today: San Francisco's Architectural Heritage*, is San Francisco's earliest official historic resource inventory. Prepared by volunteers, the survey provides a photograph and concise historical data for approximately 2,500 properties in San Francisco. The San Francisco Board of Supervisors adopted the survey in 1970 under Resolution No. 268-70. The survey files are archived at the Koshland History Center, at the San Francisco Public Library.

The Potrero Trolley Coach Division maintenance/operations facility is not listed in *Here Today*, either in the book or the survey files.

C. Department of City Planning Architectural Quality Survey

Between 1974 and 1976, the San Francisco Planning Department completed an inventory of architecturally significant buildings in San Francisco. Planning Department staff assigned each surveyed building a numerical rating ranging from "0" (contextual importance) to "5" (individual significance of the highest degree). An advisory committee consisting of architects and architectural historians assisted in assigning ratings to the roughly 10,000 buildings surveyed. The Planning Department surveyed both contemporary and older buildings, but the inventory assessed only architectural significance, which was defined as a combination of the following characteristics: design features, urban design context, and overall environmental significance. When completed, the Architectural Quality Survey (AQS) was believed to comprise the top 10 percent of the city's building stock.[1] In the estimation of survey participants, buildings rated

[1] San Francisco Planning Department, *San Francisco Preservation Bulletin No. 11 – Historic Resource Surveys* (San Francisco: n.d.), 3.

"3" or higher represented the top 2 percent of the city's building stock. The San Francisco Board of Supervisors adopted the survey in 1978 under Resolution No. 78-31. Although the survey's methodology is inconsistent with contemporary survey methodology as outlined in CEQA Guidelines PRC 5024.1(g), the Planning Department has been directed to consult the survey for informational purposes.

The Potrero Trolley Coach Division maintenance/operations facility is not listed in the 1976 Architectural Quality Survey.

D. San Francisco Heritage Surveys

San Francisco Heritage (Heritage) is the city's oldest not-for-profit organization dedicated to increasing awareness of, and advocating for, the preservation of San Francisco's unique architectural and cultural heritage. Heritage has completed several major historic resource inventories in San Francisco, including Downtown, the South of Market, the Richmond District, Chinatown, the Van Ness Corridor, the Northeast Waterfront, and Dogpatch. Heritage ratings range from "D" (minor or no importance) to "A" (highest importance). Ratings, which are based on the Kalman Methodology, are based on both architectural and historical significance.

Heritage has not surveyed the Potrero District and it does not have a file for the Potrero Trolley Coach Division maintenance/operations facility.

E. Article 10 of the San Francisco Planning Code

San Francisco City Landmarks are buildings, structures, sites, districts, and objects of "special character or special historical, architectural or aesthetic interest or value and [that] are an important part of the City's historical and architectural heritage."[2] Adopted in 1967 as Article 10 of the San Francisco Planning Code, the San Francisco City Landmark program recognizes significant buildings and districts and protects them from inappropriate alterations and demolition through project review by the San Francisco Historic Preservation Commission. As of 2017, there were 273 individually landmarked properties and 13 designated historic districts subject to Article 10. The Article 10 designation process originally used the Kalman Methodology, a qualitative and quantitative method for evaluating the significance of historic properties, but in 2000, Article 10 was amended to use National Register criteria.

The Potrero Trolley Coach Division facility is not a San Francisco City Landmark and it is not a contributor to any locally designated historic districts.

F. Showplace Square Survey

In 2008-09, the San Francisco Planning Department hired Kelley & VerPlanck Historical Resources Consulting (Kelley & VerPlanck) to survey the Showplace Square neighborhood.[3] The Showplace Square Survey was part of the Planning Department's long-range planning efforts for the Eastern Neighborhoods Plan. The surveys were completed to identify historically, culturally, and architecturally significant properties and districts before changes were made to zoning and height and bulk limits. The boundaries of the Showplace Square survey area included the industrial parts of the northern Mission and Potrero Districts, as well as small parts of the adjoining South of Market Area and the Mission Bay neighborhood. Altogether,

[2] San Francisco Planning Department, *San Francisco Preservation Bulletin No. 9 – Landmarks* (San Francisco: January 2003).
[3] The author of this HRE was a principal and co-owner of Kelley & VerPlanck Historical Resources Consulting and he evaluated the Potrero Trolley Coach Division facility.

the survey encompassed 736 acres and approximately 550 individual properties. Reports completed by Kelley & VerPlanck included the *Showplace Square Historic Context Statement*, Department of Parks and Recreation (DPR) 523 A (Primary) forms for every property in the survey area, DPR 523 B (Building, Structure, & Object) forms for 24 selected individual properties, and DPR 523 D (District) forms for three potential historic districts.[4]

Kelley & VerPlanck prepared DPR 523 A and B forms for the Potrero Trolley Coach Division maintenance/operations facility, which was recorded under its historic name, the San Francisco Municipal Railway Potrero Car Barn. The DPR 523 A form briefly documented the facility, concentrating on the 1915 car barn. The DPR 523 B form provided a brief history of the property, and identified City Engineer Michael M. O'Shaughnessy as the designer of the building. The 523 B form concluded that the Potrero Trolley Coach Division maintenance/operations facility appeared eligible for listing in the California Register under Criterion 1 (Events) "for its association with the early days of the San Francisco Municipal Railway, and in particular the expansion of Muni service south of Market Street." The evaluation also found the building eligible under Criterion 3 (Design/Construction) "as an example of a type (municipal car barn), period (World War I), method of construction (reinforced-concrete), as well as the "work of a master," City Engineer Michael M. O'Shaughnessy.[5] See Appendix **Item A** for the DPR 523 A and B forms completed for the Potrero Trolley Coach Division maintenance/operations facility as part of the Showplace Square Survey.

G. California Historical Resources Information System

Properties listed in the California Historical Resources Information System's (CHRIS) Historic Property Data File, including properties under review by the California Office of Historic Preservation (OHP) or the National Park Service, are assigned California Historical Resource Status Codes (status codes) ranging from "1" to "7." These status codes establish a baseline record of historical significance. Properties with a status code of "1" are already listed in the California Register or the National Register. Properties with a status code of "2" have been formally determined eligible for listing in either register. Properties with a status code of "3" or "4" appear eligible for listing in either register through survey evaluation. Properties with a status code of "5" are "locally significant" or of "contextual importance." Status codes of "6" indicate that the property has been determined ineligible for either register, and a status code of "7" indicates that the property has not yet been evaluated.

Based its evaluation in the Showplace Square Survey, the Potrero Trolley Coach Division maintenance/operations facility has a California Historical Resource Status Code of "3CS," meaning that it is already listed in the California Register and a historical resource under CEQA guidelines.[6]

[4] Kelley & VerPlanck Historical Resources Consulting, *Showplace Square Historic Context Statement* (San Francisco: October 2009), 1-3.
[5] Kelley & VerPlanck Historical Resources Consulting, *DPR 523 A and B Forms for San Francisco Municipal Railway Potrero Car Barn* (San Francisco: June 12, 2008).
[6] California Office of Historic Preservation, *Directory of Properties in the Historic Property Data File for San Francisco County.*

IV. Property Description

A. Context

The Potrero Trolley Coach Division maintenance/operations facility is located in the northern Potrero District, not far from its boundary with the adjoining Mission District. Today, the neighborhood surrounding the subject property is known as Showplace Square in recognition of the large number of wholesale design/retail businesses that migrated there in the late 1970s and early 1980s. In recent years, many of these businesses have themselves been displaced as high technology companies searching for raw "creative space" have bid up rents on warehouses and factories in Showplace Square. There are some industrial enterprises left in the neighborhood, including several food processing, printing, auto repair, and other light manufacturing operations, but it seems that their days are numbered. Indeed, aside from the Anchor Brewery at Mariposa and De Haro Streets, the subject property is the largest property still in industrial use in the Showplace Square neighborhood. Heavily urbanized, the neighborhood's only public open spaces are Jackson Playground and Franklin Square. The latter, which is located just north of the subject property, is a somewhat neglected inner city park bounded by 16th, Hampshire, 17th, and Bryant Streets.

The subject property consists of two square blocks bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west. The terrain slopes uphill toward the north and east and downhill toward the south and west. Seventeenth Street and Bryant Street are both heavily traveled two-lane streets connecting the northern Potrero District to the Mission District and the South of Market Area, respectively. Mariposa Street, which dead-ends at Harrison Street three blocks west, is much quieter, serving just the immediate area. The same is true for Hampshire Street, a lightly traveled street that dead-ends at 17th Street, just east of Franklin Square. Other major north-south arteries nearby include Potrero Avenue, a four-lane arterial that separates the flat, industrial part of the Potrero District from the heavily residential Potrero Hill neighborhood. Meanwhile, Harrison Street, three blocks to the west, is the traditional boundary between the Potrero and Mission Districts. The Mission and Potrero Districts were surveyed at different times and the blocks have different dimensions, accounting for the many dogleg intersections along Harrison Street. Muni bus and trolley coach lines serving the neighborhood include the 9 San Bruno, 27 Bryant, 22 Fillmore, 33 Ashbury, and 55 16th Street lines. There are many overhead wires on the streets surrounding the Potrero Trolley Coach Division maintenance/operations facility to serve these lines, as well as other trolley coaches based at Potrero.

In terms of their architectural character, the blocks surrounding the Potrero Trolley Coach Division maintenance/operations facility contain a diverse range of property types appropriate to this mixed-use neighborhood, including industrial, commercial, residential, and recreational properties. The front of the facility faces the 2500 block of Mariposa Street, which contains several former industrial properties, KQED's radio and television studio, and several high-density residential projects completed in recent decades. The north side of Mariposa between Hampshire Street and Potrero Avenue contains a two-story, wood-frame industrial building at 2440 Mariposa Street. Built in 1948, the building is designed in the Modernist style **(Figure 2)**. Located next-door at 2424 Mariposa Street is the Verdi Club, a two-story, reinforced-concrete music venue and Italian-American social hall designed in the Art Deco style **(Figure 3)**. Built in 1936, the building is a Category A-Historic Resource. To the east of the Verdi Club is a contemporary condominium building at 480 Potrero Avenue. The south side of Mariposa Street east of Hampshire Street contains just one property, a 64-unit affordable housing project, known as Mariposa Gardens, which was constructed in 1983 at 500-10 Potrero Avenue. Stucco-clad, with gable roofs and aluminum slider windows, Mariposa Gardens is designed in a non-descript contemporary style **(Figure 4)**.

Figure 2. 2440 Mariposa Street (foreground).

Figure 3. Verdi Club, 2440 Mariposa Street.

Figure 4. Mariposa Gardens, looking southeast from Mariposa and Hampshire Streets.

The south side of Mariposa Street opposite the Potrero Trolley Coach Division facility contains three former industrial buildings, including a four-story, reinforced-concrete warehouse at 500-30 Hampshire Street **(Figure 5)**. Built in 1940, the large L-shaped building is designed in the Late Moderne style. It now contains condominiums and a restaurant. Located next-door is 2505 Mariposa Street, a two-story, wood-frame warehouse designed in a utilitarian mode. Built in 1923, the building is presently vacant. At the southeast corner of Mariposa and York Streets is a two-story, reinforced-concrete warehouse built in 1954. Designed in the Late Moderne style, 501 York Street is now an office building **(Figure 6)**.

Figure 5. 500-30 Hampshire Street (left) and 2505 Mariposa Street (right), looking southeast.

Figure 6. 501 York Street, looking southeast.

Occupying the entire frontage of the south side of Mariposa Street between York and Bryant Streets is the KQED radio and television studio at 1901 Bryant Street. Three stories in height and built of plywood with stucco cladding, the sprawling building features a non-descript, utilitarian appearance appropriate to its era of construction in 1989 **(Figure 7)**.

Figure 7. KQED studios at 1901 Bryant Street, looking southwest.

Located on the opposite side of Bryant Street from the KQED studio is the former Best Foods factory, a complex of nine buildings that occupy the entire block bounded by Bryant, Mariposa, Florida, and 18th Streets. Built in 1923, the complex is designed in the American Commercial style and is typical of daylight-frame industrial buildings of this era **(Figure 8)**. The complex now contains offices, live-work space, and commercial and retail storefronts.

Figure 8. Former Best Foods plant at 1900 Bryant Street, looking southwest.

Located opposite the Potrero Trolley Coach Division maintenance/operations facility on Bryant Street is 1890 Bryant Street, which was built in 1949 as an annex to the Best Foods plant on the south side of the street. The three-story, reinforced-concrete building is designed in a utilitarian mode indicative of its post-World War II era of construction **(Figure 9)**. The building, which was remodeled and expanded in the early 2000s, is presently used as live-work lofts.

Figure 9. Former Best Foods Extension at 1890 Bryant Street, looking northwest.

Continuing north along the west side of Bryant Street is 1850 Bryant, a two-story, concrete block commercial building with a sign reading "Abbett Electric Corporation." Built in 1975, the building is designed in a contemporary utilitarian vocabulary **(Figure 10)**. Located just north of 1850 Bryant Street is a parking lot associated with the Abbett Electric Corporation building **(Figure 11)**. The northernmost property on the 1800 block of Bryant Street, which adjoins the parking lot, is a three-story, wood-frame "live-work" loft building constructed in 2000 **(Figure 12)**.

Figure 10. 1850 Bryant Street, looking west.

Figure 11. Parking lot associated with 1850 Bryant Street, looking west.

North of 17th Street, the 1700 block of Bryant Street opposite Franklin Square is an idiosyncratic residential enclave in an otherwise industrial/commercial neighborhood. The only non-residential property on the block is the corner building at 1798 Bryant Street, a one-story, reinforced-concrete commercial structure. Built in 1967, the brick-clad building is designed in a contemporary vernacular vocabulary **(Figure 13)**. The rest of the buildings on the block are Victorian and Edwardian-era, two and three-story flats – some with commercial storefronts at the first floor level – including 1712-16 Bryant (built 1905), 1718-22 Bryant (built 1900), 1724 Bryant (built 1907), 1728 Bryant (built 1900), 1730-34 Bryant (built 1900), 1736 Bryant (built 1904), 1740-42 Bryant (built 1905), and 1744-46 Bryant Street (built 1907) **(Figure 14)**.[7] The row was most likely built to take advantage of its proximity to Franklin Square, a rare patch of open space in an otherwise industrial neighborhood.

Figure 12. 1800 Bryant Street, looking west.

Figure 13. 1798 Bryant Street, looking northwest.

Figure 14. 1700 block of Bryant Street, looking west from Franklin Square.

Franklin Square occupies the entire block on the north side of 17th Street between Bryant and Hampshire Streets, and is across the street from the Potrero Trolley Coach Division maintenance/operations facility. Set aside as a public park in 1855, Franklin Square was not developed until the early twentieth century. Originally designed as a formally landscaped Victorian park, most of Franklin Square is now occupied by an enclosed soccer field built in 1984. The soccer field is surrounded by high chain-link fencing separating it from the rest of the park. The remainder of the park, which is bounded by a crumbling concrete bulkhead, contains a children's play area, a toilet room, several large eucalyptus trees, and other perimeter plantings **(Figures 15-18)**. Hampshire Street, which dead-ends just north of 17th Street, forms the eastern boundary of the park, separating Franklin Square from the former Lux School of Industrial Training (now the SGI Cultural Center) at 2450 17th Street **(Figure 19)**. Built of reinforced-concrete and designed in the Renaissance Revival style, the highly intact historic school building, which sits atop a high rock outcropping, is a "Category A-Historic Resource."

[7] All of San Francisco's building and assessment records were destroyed in the 1906 Earthquake and Fire. As the City was reconstituting its records, it provided default construction dates of 1900 to many pre-1906 buildings.

Figure 15. Franklin Square, looking northwest from 17th Street.

Figure 16. Franklin Square, looking northeast from 17th Street.

Figure 17. Entrance to Franklin Square at 17th and Bryant Streets.

Figure 18. Franklin Square, looking southeast from 16th and Bryant Streets.

Figure 19. Former Lux School of Industrial Training, looking northeast from 17th Street.

The 400 block of Hampshire Street, which is across the street from the Potrero Trolley Coach Division maintenance/operations facility, is a quiet block lined by several industrial buildings. Beginning at the intersection of 17th and Hampshire Streets is the Leyser-Green Co. Building, a two-story, reinforced-concrete industrial building designed in the American Commercial style **(Figure 20)**. Built in 1909 as a factory, the building now contains offices. It is a Category A – "Historic Resource."

Figure 20. Leyser-Green Co. Building at 2401-25 17th Street, looking southeast from 17th Street.

Figure 21. 445 Hampshire Street, looking northeast.

Adjoining the Leyser-Green Co. Building to the south is 445 Hampshire Street, a heavily remodeled, one-story, reinforced-concrete industrial building built in 1924 **(Figure 21)**. Finished in smooth stucco and punctuated by aluminum sliders and roll-up metal doors, the building appears much newer than its construction date would otherwise suggest. South of 445 Hampshire Street is 475 Hampshire Street, a four-story, wood-frame, "live-work" loft building constructed in 2001.

Figure 22. Mariposa Bus Yard, looking southwest.

B. Site

Figure 23. Mariposa Bus Yard, looking south, showing electrical poles and overhead wires.

The Potrero Trolley Coach Division maintenance/operations facility occupies a two-block site measuring 480 feet along 17th and Mariposa Streets and 400 feet along Bryant and Hampshire Streets. Less than fifty percent of the site is occupied by buildings, with the western half, as well as the vacated York Street right-of-way, occupied by the asphalt-paved Mariposa Bus Yard **(Figure 22)**. Due to the grade change between the northern and southern edges of the site, the bus yard is only at grade along Mariposa Street. Along 17th Street, it is approximately 20 feet below-grade. High concrete retaining walls line the northern side and a portion of the western side of the bus yard. The yard is paved in asphalt with painted and numbered parking lanes occupying the center of the yard **(Figure 23)**. Overhead catenary lines mounted on steel poles provide power for the off-duty electric trolley coaches that are stored and serviced in the bus yard. Several work stations are located around the perimeter of the yard, including a coach washing stand on the north side **(Figure 24)**, an outdoor running repair station on the west side, and a fare collection and a defunct vacuum station on the east side **(Figure 25)**.

Figure 24. Wash stand, looking west.

Figure 25. Entrance to bus yard, looking northwest.

The Potrero Trolley Coach Division facility has several other paved areas, including a small parking lot in front of the building on Mariposa Street, and a parking deck above the maintenance facility. Accessed through a gate on 17th Street, the parking deck is paved in asphalt and striped to accommodate both off-duty trolley coaches, "non-revenue" vehicles, and employees' cars **(Figures 26-27)**. Similar to the bus yard, the parking deck features overhead catenary wires mounted on steel poles.

Figure 26. Parking deck, looking east.

Figure 27. Parking deck, looking northeast.

The only portion of the site not occupied by either buildings or parking lots is an approximately 25-foot-deep strip of asphalt in front of the maintenance/operations building. This setback was originally required to allow streetcars, which cannot make ninety-degree turns, sufficient clearance to turn off Mariposa Street into the building. Historically occupied by curved rail sidings, today the space is paved in asphalt. A section of the setback located near the main entrance to the bus yard contains a small lozenge-shaped, concrete "control tower" built in 1990, where drivers check in at the beginning and end of every shift **(Figures 28-29)**.

The bus yard is enclosed within 10-foot-high, galvanized steel tube fencing with balusters that curve outward at the top. Gates on both 17th and Mariposa Streets provide access to the site. The fencing, installed in 1991, makes use of what appear to be historic piers. Street trees planted at the same time the fence was installed include *Eucalyptus Nicholii* (willow peppermint) along 17th Street, *Platanus Acerifolia* (London plane) along Hampshire Street, and an unidentified tree species on Bryant Street **(Figures 30-33)**.

Figure 28. Paved setback in front of maintenance/operations building, looking north.

Figure 29. Paved setback and control tower in front of maintenance/operations building, looking northeast.

Figure 30. Perimeter fencing and street trees, looking northeast from Mariposa and Bryant Streets.

Figure 31. Perimeter fencing and street trees, looking southeast from 17th and Bryant Streets.

Figure 32. Gate on 17th Street, looking south from Franklin Square.

Figure 33. Street trees on Hampshire Street, looking northwest.

C. Maintenance/Operations Building

The eastern half of the Potrero Trolley Coach Division facility is occupied by the maintenance/operations building. The rectangular-plan building has a concrete perimeter foundation and a flat roof. Due to the change in grade between the north and south sides of the property, the first floor level is fully above-grade on Mariposa Street and below-ground on 17th Street. This allows the roof of the maintenance building to be used as a parking deck with additional maintenance shops. Built in 1915 as a one-story car barn for Muni streetcars operating on its south of Market lines, the building was enlarged in 1924 with several additions, including an office wing along Mariposa Street and two shops at 17th and Hampshire Streets. In 1948-49, the Public Utilities Commission converted the building into an electric trolley coach maintenance and operations facility, a use it has retained to this day. Constructed of reinforced-concrete with cement plaster ornament, the two-story office wing facing Mariposa Street is designed in the Renaissance Revival style. A modest amount of original ornament survives along the Hampshire Street façade as well. The first floor level of the interior consists of Maintenance Department facilities, including "heavy" and "running" repair bays, machine and tire shops, offices, storage rooms, and maintenance staff facilities. The second floor level of the office building houses the Operations Department, and it includes offices, training facilities, a dispatch office, men's and women's toilet rooms, a locker room, and a "Gilley" room for the use of operators on break or between shifts. The following sections describe each of the building's four exterior elevations and then each of its primary interior spaces.

Figure 34. Primary façade of maintenance/operations building, looking northwest from Hampshire and Mariposa Streets.

Exterior: Primary (Mariposa Street) Façade

The primary façade of the maintenance/operations building faces south toward Mariposa Street. Finished in cement plaster, it is seven bays wide and two stories high **(Figure 34)**. The Mariposa Street façade is subtly embellished with molded cement plaster ornament, including reentrant corners, Tuscan pilasters and door hoods, a bold intermediate cornice, and a shallow cornice embellished with circular medallions. The westernmost (left) bay, which is partly concealed behind the control tower, projects outward about six inches from the rest of the façade. At the first floor level, it retains an original vehicular entrance featuring a decorative surround and a bracketed architrave. The frieze just below the architrave is embellished with an incised inscription reading "MUNICIPAL RAILWAY AD 1915" **(Figure 35)**. The bay is now infilled with concrete and stucco. Above the doorway, at the second floor level, the left bay contains three widely spaced double-hung steel windows with a light pattern of six-over-six. The next bay to the east is the location of the main entrance at 2500 Mariposa Street. The first floor features a concrete infill panel punctuated by an aluminum storefront and a metal roll-up door –both added in 1990. The storefront is divided into a grid of large fixed lights by aluminum mullions. The transom is emblazoned with the building's address. At the top of the concrete infill panel are Muni's "worm" logo and orange letters that read "POTRERO DIVISION." Similar to its neighbors, this bay is flanked by Tuscan pilasters and capped by a broad intermediate cornice that extends across the rest of the façade. Just like the rest of the primary façade, the second floor level contains three double-hung metal windows and is capped by a modest cornice.

Figure 35. Two westernmost bays of the primary façade, looking north.

Figure 35. Inscription above doorway.

The remaining five bays of the primary façade are essentially identical, featuring wide vehicular bays at the first floor level and three double-hung windows in the office wing above **(Figure 36)**. Each bay is defined by Tuscan pilasters, except for the easternmost bay, which was widened in 1948-49, destroying the pilasters and the bracketed architrave seen in the westernmost bay. Above the vehicular entrances is the broad intermediate cornice described above. At the second floor level, all of the bays are essentially the

same **(Figure 37)**. A continuous lug sill forms the base of each grouping of windows. This sill projects out several inches below the center window in each grouping, adding a subtle visual rhythm to the primary façade. Similar to its counterpart on the west side of the primary façade, the easternmost bay projects out about six inches beyond the rest of the façade. Otherwise, it is the same, except for a circular medallion above the center window that features Muni's original logo **(Figure 38)**. A wood flagpole is mounted on the roof behind the parapet of the easternmost bay.

Figure 36. Primary façade, looking northwest.

Figure 37. Easternmost bays of primary façade, looking north.

Figure 38. Original Muni logo on primary façade.

Figure 39. Secondary façade, looking northwest from Hampshire and Mariposa Streets.

Figure 40. Secondary façade, looking southwest from Hampshire and 17th Streets.

Exterior: Secondary (Hampshire Street) Façade

The secondary façade of the maintenance/operations building faces Hampshire Street to the east **(Figures 39-40)**. Like the primary façade, it is two stories high, except for the rear portion near 17th Street, which consists of a wall and a small control room (now abandoned). It is finished entirely in cement plaster with a modest amount of ornament. The nearly 400-foot-long façade is almost windowless, except for the two-story office wing near Mariposa Street.

The southernmost part of the Hampshire Street façade is detailed the same as the primary façade because it is part of the office wing **(Figure 41)**. This section is finished in cement plaster and embellished with a modest amount of Renaissance Revival ornament, including reentrant corners, a broad intermediate cornice, and a shallow upper cornice. The first floor level features a highly ornamented pedestrian entrance at the left side. The entrance is embellished with a cable molding and a Tuscan architrave. The frieze below the architrave has incised lettering that reads "OFFICE." To the right of the entrance are three evenly spaced, steel multi-light windows. The second floor level is articulated by four double-hung metal windows with a light pattern of six-over-six. These windows match the primary façade.

Figure 41. Southernmost section of secondary façade facing Hampshire Street, looking northwest.

The rest of the secondary façade is essentially windowless and obscured behind a row of London plane trees **(Figure 42)**. It is divided into horizontal bands by an intermediate cornice. Three metal windows are located at the first floor level just above

Figure 42. Middle section of secondary façade, looking northwest.

the sidewalk toward the left. This part of the building is capped by a cornice that matches the primary façade.

Figure 43. Northern section of secondary façade, looking southwest from Hampshire and 17th Streets.

The northernmost part of the Hampshire Street façade is a wall (built in 1948-49) and a small office formerly used as the Operations Department's control center (also built in 1948-49 –now abandoned) **(Figure 43)**. Detailed the same, the wall and the former control room are finished in cement stucco and capped by a narrow crown molding. The control room features a wrap-around metal window at the corner of 17th and Hampshire Streets.

Tertiary (17th Street) Façade

The tertiary façade of the maintenance/operations building faces 17th Street. Due to the grade change between Mariposa and 17th Streets, the only exposed portions of the north façade are the former control room, the rear wall of the maintenance bays, and the rear wall of the two-story office wing on Mariposa Street. The north wall of the former control room is finished in cement plaster and capped by a narrow crown molding. It is fenestrated with a six-light fixed window **(Figure 44)**. The north wall of the maintenance bays, which contain the tire shop and the paint shop, are utilitarian and without any ornament. The shops were originally designed to match the Mariposa and Hampshire Street façades but the ornament was stripped in 1948-49 when the building was converted into a trolley coach facility. The east maintenance bay has a contemporary overhead roll-up door and the west bay contains folding metal accordion doors that date to the 1949-49 remodel **(Figure 45)**. The north wall of the office wing is finished in cement plaster, largely windowless, and entirely utilitarian, featuring a handful of non-historic metal doors and two metal awning windows arranged in an asymmetrical pattern **(Figure 46)**.

Figure 44. North wall of former control room

Figure 45. North façade of second floor maintenance shops, looking south from parking deck.

Figure 46. North façade of second floor office wing, looking south from parking deck.

Quaternary (Bryant Street) Façade

The quaternary façade faces west toward the Mariposa Bus Yard and Bryant Street **(Figure 47)**. It is composed of two sections: the west façade of the second floor maintenance bays and the much larger section that adjoins the bus yard. The latter section is furthermore composed of two sections: the one-story maintenance shops to the north and the two-story office wing near Mariposa Street.

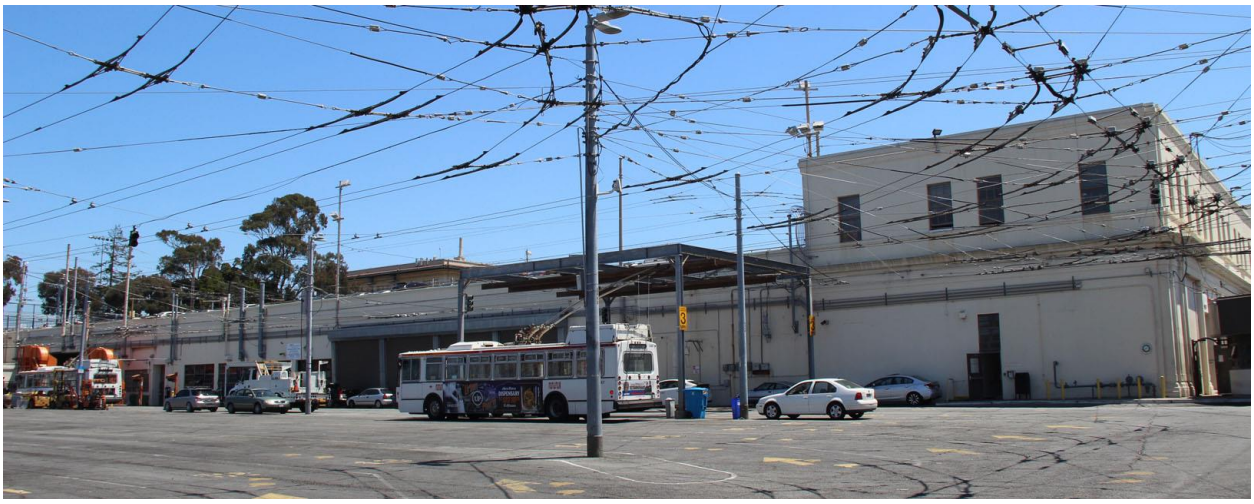


Figure 47. West façade of maintenance /operations building, looking northeast from bus yard.

The west façade of the second floor maintenance shops is finished in cement plaster without any ornament **(Figure 48)**. This façade is divided into 11 bays by plain concrete piers. Every other bay is articulated by a large multi-light steel industrial window. A roof-mounted skylight is visible above the parapet on the roof.

Figure 48. West façade of second floor maintenance shops, looking northeast from parking deck.

The portion of the west façade facing the bus yard is 18 bays wide. The northernmost section consists of a large vehicular entrance and an adjoining bay containing a multi-light steel industrial window **(Figure 49)**. Similar to the north bay, the next seven bays date to the 1948-49 remodel. The first four bays feature tripartite steel industrial windows with operable awning sashes. The remaining two bays contain pairs of older wood accordion doors installed in 1948-49 **(Figure 50)**. The next five bays feature modern overhead door inserts installed Ca. 2000 **(Figure 51)**. The southernmost part of the west façade, which is part of the two-story office wing, is also heavily altered, consisting of several infilled window openings and a non-historic pedestrian entrance added in 1989-90. The second floor level of the office wing matches Hampshire Street, with four double-hung metal windows with a light pattern of six-over-six **(Figure 52)**.

Figure 49. Vehicular entrance at north end of west façade, looking east from bus yard.

Figure 50. Older windows and doors on west façade, looking northeast from bus yard.

Figure 51. Contemporary overhead doors on west façade, looking northeast from bus yard.

Figure 52. Two-story office wing on west façade, looking east from bus yard.

Interior: First Floor Level Maintenance Shops

The maintenance shops occupy nearly the entire first floor level of the maintenance/operations building. The linear maintenance bays occupy the vast majority of what was historically the original 1914 car barn. Labeled in sequence from Bays 20 to 29, the maintenance bays are divided into two sections, with Bays 20-25 used for "heavy" repairs and Bays 26-29 for minor "running" repairs. A row of large concrete piers divides the two sections **(Figure 53)**. The floors are formed of thick concrete and the walls and ceilings are made of poured-in-place, board-formed concrete. The ceilings are divided into coffers by oversized beams that run from east to west across the building. All trolley coaches undergoing maintenance enter the building from the vehicular entrance shown in **Figure 50**. From there they turn into one of the maintenance bays. Catenaries are attached to the ceiling to power the trolley coaches inside the building **(Figure 54)**. Shallow maintenance pits are located in the floor of the repair bays **(Figures 55-56)**. Mechanics use the pits to repair the trolley coaches, although the pits are much too shallow for most Muni maintenance staff members to stand upright. Compounding the problem, the ceiling is too low to lift a coach high enough to work on it from below, meaning that many repairs must be made outside in the bus yard. Once repaired, the trolley coaches exit the building at Mariposa Street and enter the bus yard further down the street.

Figure 53. Maintenance bays, looking south.

Figure 54. Detail of Bay 29, looking north.

Figure 55. Maintenance pit, looking south.

Figure 56. Maintenance pit, looking south.

Flanking the maintenance bays to the west is a row of offices, shops, and staff rooms, including the parts shop, machine shop, tool room, brake shop, electronics shops, superintendent's office, locker room, men's and women's toilet rooms, lunch room, and a cluster of heavy repair bays that are now used for storage because they are too shallow to accommodate modern trolley coaches **(Figure 57)**. The shops are similar to the maintenance bays, with concrete floors and poured-in-place, board-formed concrete walls and ceilings. Most of the shops and offices were partitioned in 1948-49, when the Potrero Car Barn was converted into a trolley coach maintenance facility. The electronics shop is newer, dating to the last decade or so. The toilet rooms, locker room, hand wash station, and lunch room were all remodeled in 1989-90. These spaces have tiled floors and gypsum board walls and ceilings with contemporary box light fixtures **(Figure 58)**.

Flanking the maintenance bays to the north is a row of small offices, storage racks, several small shops, as well as a stair that provides access to the parking deck and the former control room at 17th and Hampshire Streets **(Figure 59)**. Flanking the maintenance bays to the east is a row of offices that extend below the sidewalk along Hampshire Street **(Figure 60)**. Originally built as toilet rooms and locker rooms, they were converted into offices in 1989-90. They have fixed metal windows and single-panel doors. Above the offices are painted-over steel windows that once illuminated a passageway that passed above the offices.

Figure 57. Heavy repair shop on west side of first floor level, looking southeast.

Figure 58. Hand wash station near toilet rooms on west side of first floor level, looking west.

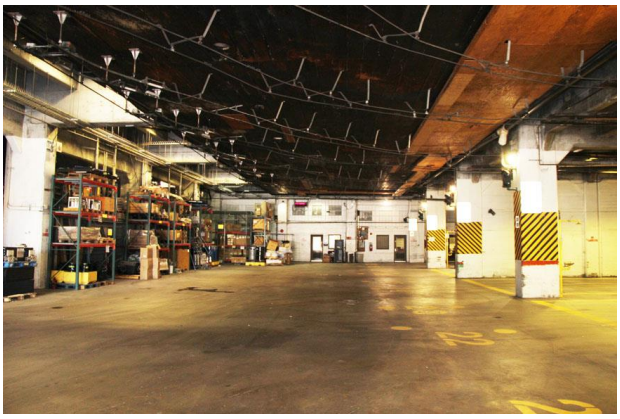


Figure 59. Storage rooms and driveway on north side of first floor level, looking east.

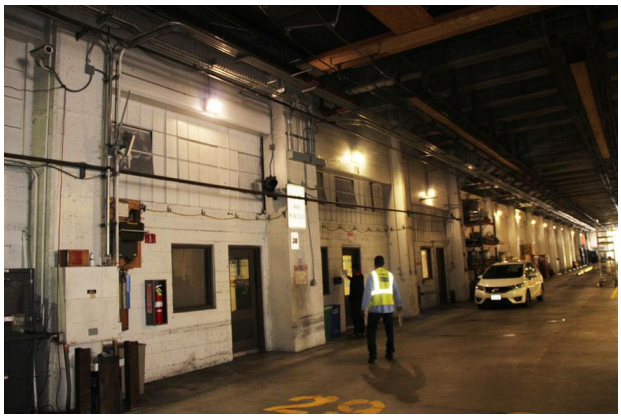


Figure 60. Shops on east side of first floor level, looking southeast.

Interior: Second Floor Level Maintenance Shops

As mentioned previously, the second floor level has two maintenance shops, the tire shop and the paint shop. With the exception of pits, which they do not have, these two shops are identical to the maintenance bays on the first floor level, with concrete flooring, poured-in-place concrete walls and ceilings, exposed concrete piers and beams, and catenary wires attached to the ceiling **(Figure 61)**.

Figure 61. Second floor maintenance shop, looking north.

Interior: Second Floor Level Operations Offices

The second floor level of the office wing houses the Potrero Division's Operations Department. The building's rectangular footprint is divided down the center by a double-loaded corridor with offices, training rooms, a locker room, men's and women's toilet rooms, a dispatch office, and a "Gilley Room." The corridor has tiled flooring, lath and plaster walls and ceilings, and wood transoms, windows, and doors **(Figure 62)**. Metal lockers line the corridor walls **(Figure 63)**. Most finishes appear to date back to the building's 1948-49 conversion into a trolley coach maintenance facility, though some spaces, including the toilet rooms, dispatch office, and Gilley Room were remodeled in 1989-90 **(Figure 64)**.

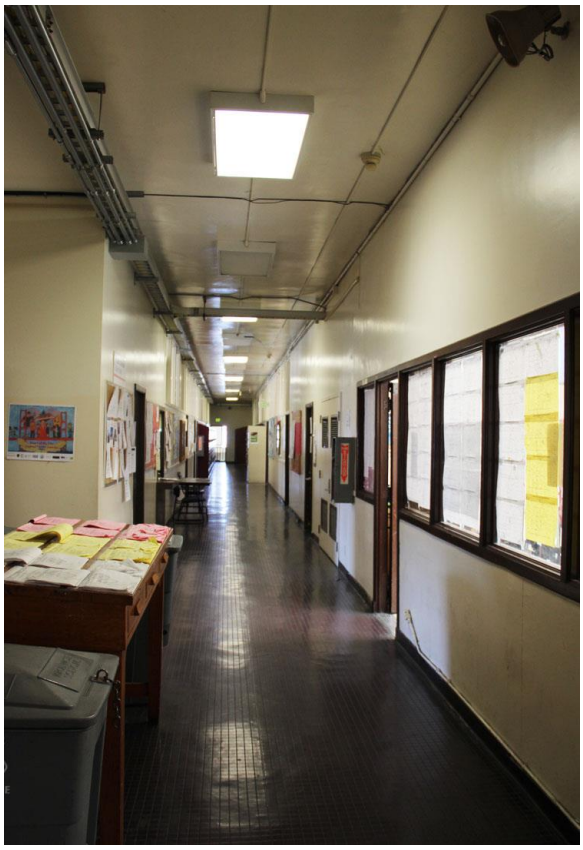


Figure 62. Corridor in office wing, looking west.

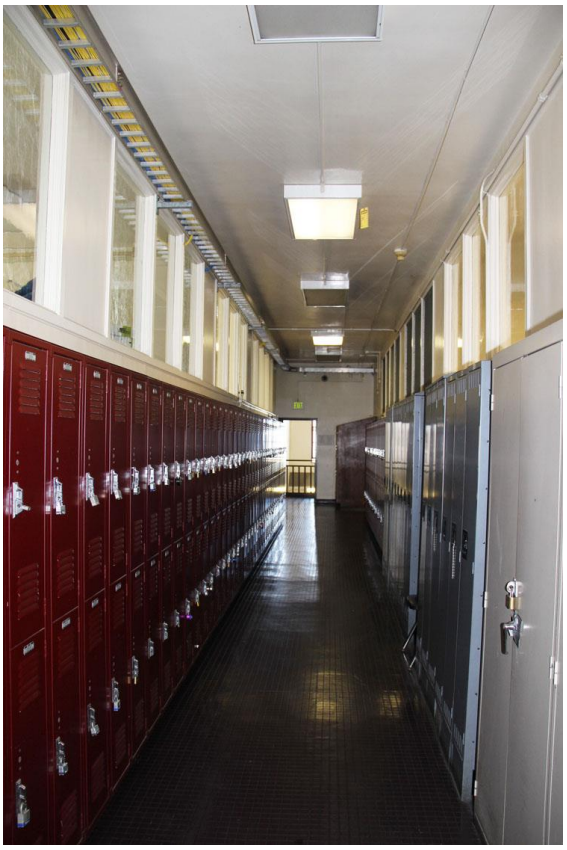


Figure 63. Lockers in corridor, looking west.

Figure 64. Typical office on second floor of office wing.

V. Historical Context

This section provides an overview of San Francisco's Showplace Square neighborhood, a construction and operational history of the Potrero Trolley Coach Division maintenance/operations facility, as well as a biography of City Engineer Michael M. O'Shaughnessy, and a brief history of car barns and bus yards in San Francisco.

A. Showplace Square[8]

The Potrero Trolley Coach Division maintenance/operations facility is located in a part of the northern Potrero District known as "Showplace Square." The name dates back to the late 1970s/early 1980s when wholesale design firms formerly based in Jackson Square began moving into the vacant and underutilized warehouses of the northern Potrero and adjoining parts of the Northeast Mission District, the South of Market Area, and Mission Bay **(Figure 65)**.

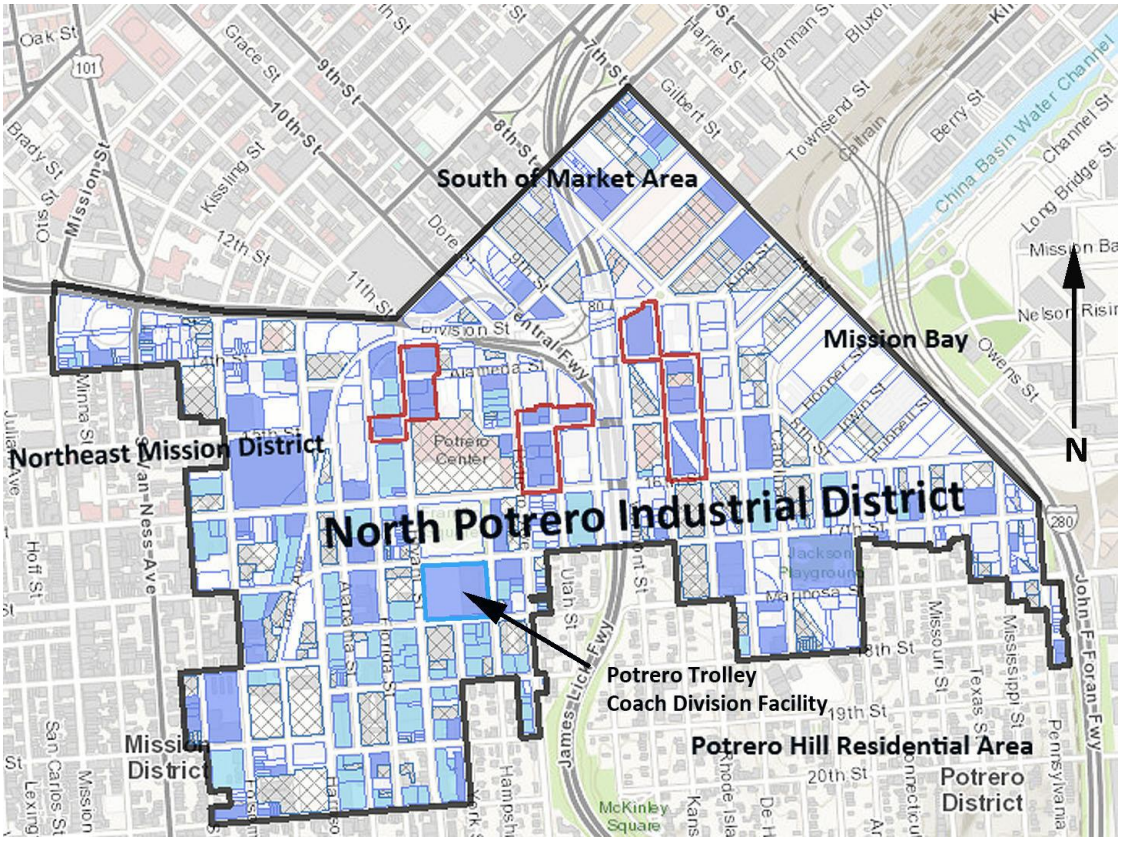


Figure 65. Map showing boundaries of Showplace Square Planning Area.
Source: San Francisco Planning Department; annotated by Christopher VerPlanck

[8] The history of the North Potrero District is distilled from the *Showplace Square Historic Context Statement* (2009) by Kelley and VerPlanck Historical Resources Consulting.

With the exception of the Central Waterfront, which emerged as a mixed-use industrial/residential district as early as the 1860s, the Potrero District remained a semi-rural backwater throughout the nineteenth century. Isolated from the rest of the city by Mission Bay, the development of the Potrero District only got underway once Mission Bay had been filled in the 1890s. Once this occurred, the northern and western slopes of Potrero Hill became ripe for industrial development. Because development arrived comparatively late, the neighborhood was a blank slate, without many pre-existing obstacles industrialization. First, there was little residential development in the area. In addition to reducing potential conflicts over noise and pollution, much of the area remained intact as large individual landholdings. These conditions were ideal for building large-footprint warehouses and factories because industrialists did not have to go through the difficult and expensive process of assembling smaller house lots into usable parcels. Furthermore, ever since Mission Bay had been filled, the northern Potrero District gained good access to piers of the Northeast Waterfront and the rail yards of Mission Bay through a network of street-level railroad tracks and industrial spurs and sidings installed by the Southern Pacific, Western Pacific, and Atchison, Topeka & Santa Fe Railroads.

The industrial development that got underway in what is now Showplace Square after 1900 surged after the 1906 Earthquake. The disaster, which had wrecked hundreds of factories and warehouses in the South of Market, led industrialists to relocate to Mission Bay and its vicinity. Industrialists who came to the area included wholesale hardware dealers, food processers and canners, cable and belt manufacturers, steel fabricators, commercial bakers, paint manufacturers, barrel makers, brewers, mattress makers, and many others. They built sprawling, state-of-the-art brick warehouse and factories, many of which still survive in Showplace Square. Transit providers, including the Market Street Railway, were also attracted to the area by its central location and large parcels. In 1893, the Market Street Railway built a powerhouse at 15th and Bryant Streets to power its growing fleet of electric streetcars.

Although industrial uses predominated in what is now Showplace Square throughout the first quarter of the twentieth century, non-industrial uses continued to be built until the passage of San Francisco's first zoning ordinance in the 1920s. Though the majority of the housing stock in the Potrero District is located on Potrero Hill itself, speculators built several small residential enclaves throughout the industrial area of the north Potrero District, including a row of 10 flats on the west side of Bryant Street between 16th and 17th Streets **(See Figure 15)**. Built between 1890 and 1907, these flats were presumably built in this location because of their proximity to Franklin Square.

Franklin Square itself is a very old public park that dates back to the 1855 Van Ness Ordinance and the concurrent Rancho Potrero Nuevo survey. As part of this survey, the City reserved certain blocks and lots for public use, including parks, schools, hospitals, police stations, etcetera. Franklin Square was set aside as a public park along with Jackson Square and Buena Vista Park (now McKinley Square). However, virtually nothing was done to improve Franklin Square throughout the nineteenth century. Indeed, Franklin Square became an informal dumping ground and squatters repeatedly built houses on it. Increasing development pressures in the Potrero District after 1900 forced the City's hand. With money allocated for its improvement, the Parks Department had just torn down the last squatter's dwelling when the 1906 Earthquake hit. The Red Cross Relief Corporation designated Franklin Square an official refugee camp and built dozens of compact refugee cottages in the park. The City cleared Franklin Square in 1907 and finished building it as a Victorian-style park in 1911 with a concrete perimeter coping, eucalyptus and palm trees, and lush lawns crisscrossed by paved footpaths. Remnants of its original design remain, including the entrance stairs on Bryant Street and much of the perimeter coping.

Two decades after Franklin Square was built, the San Francisco Seals, a Pacific Coast League team, built a baseball stadium just north of the park, adding a second recreational facility to the neighborhood. The 18,500-seat stadium opened in 1931. Seals Stadium and Franklin Square are both visible on aerial photographs taken by Harrison Ryker in 1938 **(Figure 66)**. Together, the two properties comprise a rare concentration of greenery in an otherwise industrial neighborhood.

Another important non-industrial property in the northern Potrero District is the former Lux School of Industrial Training. Built in 1913 at 17th and Hampshire Streets, just across the street from Franklin Square, the Renaissance Revival-style school building was designed by architect William C. Hays. It was built with an endowment from cattle baroness Miranda Lux as a vocational training school for working-class girls. In 1953, it merged with the Lick-Wilmerding School, and in 1955, the school moved to Ocean Avenue. After this, the school became a union hall. It is now home to a Buddhist organization.

Figure 66. Seals Stadium and Franklin Square, 1938.
Source: David Rumsey Map Collection

Expansion of industrial uses continued in the northern Potrero District until World War II. After the war, dozens of San Francisco industrialists moved their businesses to Emeryville, South San Francisco, San Leandro, and other industrial suburbs where large plots of land, lower taxes, better freeway access, and anti-union policies beckoned. As San Francisco continued to deindustrialize, several warehouses and factories in the northern Potrero District found new life in the 1970s as home to wholesale furniture and design firms. Pushed out of increasingly expensive Jackson Square, owners of these businesses embraced the large warehouses in the northern Potrero District because of their large floorplates, freeway access, and ample parking. By the early 1980s, the proliferation of design showrooms in the northern Potrero District and the adjoining Northeast Mission District gave this part of the city a new nickname: "Showplace Square." These days Showplace

Square is again transforming, as high-tech executives in search of "creative space" bid up rents and displace the remaining design showrooms and legacy manufacturers. Meanwhile, vacant and underutilized lots and former railroad rights-of-way are being redeveloped with luxury condominiums.

B. Historical Development of the Future Site of the Potrero Trolley Coach Division Facility: 1857–1914

According to the 1857 U.S. Coast and Geodetic Society Map of San Francisco, what is now the site of the Potrero Trolley Coach Division maintenance/operations facility was undeveloped pastureland on the south slope of a low rise northwest of Potrero Hill. Several footpaths connecting the rural area to the more heavily urbanized Mission District west of Mission Creek **(Figure 67)** crisscrossed the site. Though the Potrero District had been surveyed two years earlier, no streets or public reservations are shown on the map.

Figure 67. 1857 U.S. Geodetic Society Map showing the future location of the Potrero Trolley Coach Division maintenance/operations facility.
Source: David Rumsey Map Collection

Published a little over a decade later, George H. Goddard's 1869 Map of San Francisco shows a tightly woven grid of streets and rectangular blocks superimposed on the steep terrain and partially submerged tidal marshlands of the Potrero District. Franklin Square is show as occupying two full city blocks on the map, though no work had been completed toward its development. Similarly, the future site of the Potrero Trolley Coach Division maintenance/operations facility is shown as two undeveloped blocks (Potrero Blocks 41 and 48) across the street from Franklin Square **(Figure 68)**.

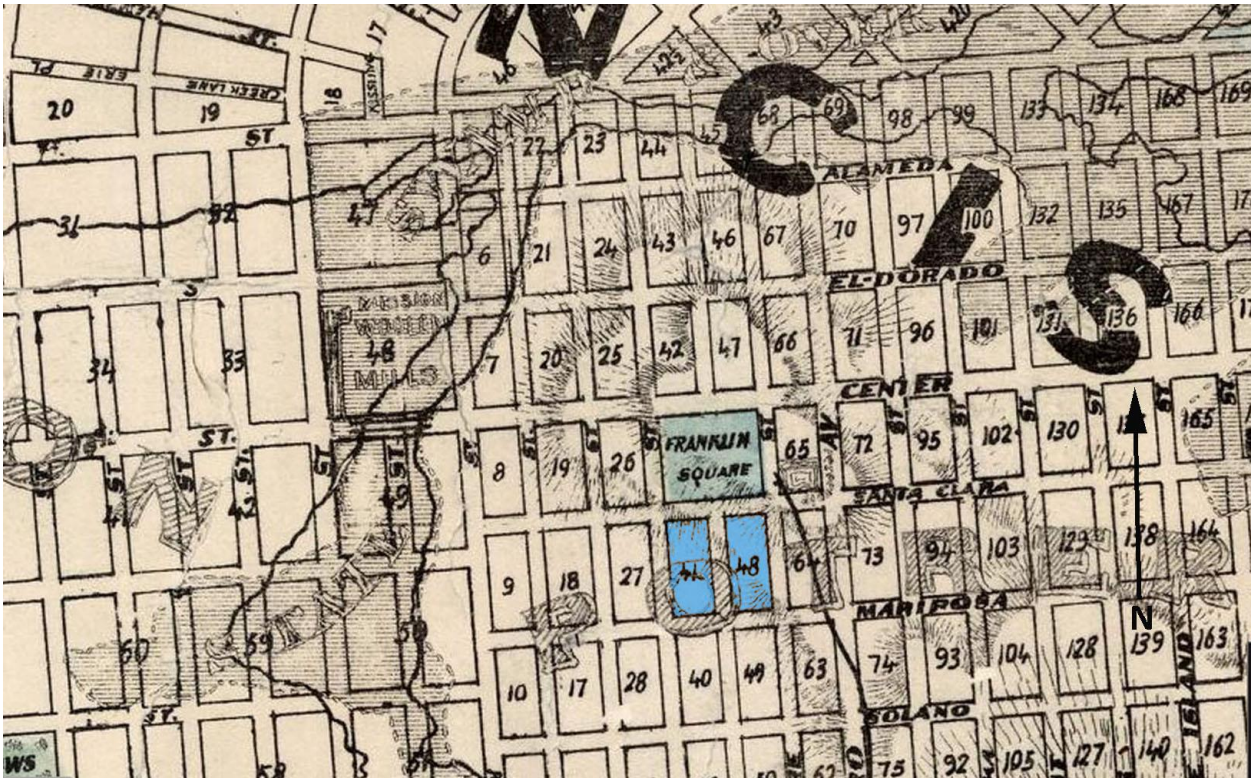


Figure 68. 1869 George C. Goddard Map of San Francisco showing the future location of the Potrero Trolley Coach Division maintenance/operations facility. Note, Santa Clara Street is now 17th Street and Center Street is now 16th Street. Source: David Rumsey Map Collection; annotated by Christopher VerPlanck

The 1873 A.L. Bancroft Map shows similar conditions to the 1869 Goddard Map. Shading indicates that all of the blocks facing Franklin Square contained at least some development. The 1873 Bancroft Map also indicates that Mission Creek, which separated the Potrero and Mission Districts, was in part filled in and that the Southern Pacific's main line ran along Harrison Street three blocks west of the subject property. Published a decade later, the 1884 U.S. Coast Survey Map shows that streets had been built throughout the level parts of the Potrero District but not on the steep flanks of Potrero Hill itself, which remained occupied by small ranches, dairies, and other rural properties. Franklin Square, which appears to contain several squatters' houses, is not identified on the 1884 map, indicating that nothing had been done to develop it and that the surveyors were probably not even aware of its existence. The site of the future Potrero Trolley Coach Division maintenance/operations facility is shown on the 1884 Coast Survey Map as two separate blocks (Potrero Blocks 41 and 48) containing a handful of houses and rural outbuildings **(Figure 69)**.

The 1889 Sanborn Maps, the first published for the Potrero District, illustrate similar – if more detailed – conditions as the 1884 U.S. Coast Survey Map. The two blocks comprising the future Potrero Trolley Coach Division maintenance/operations facility were still rural. There was one large house with several outbuildings at the northeast corner of Potrero Block 41 and several cottages and rural outbuildings on the northern half of Potrero Block 48 **(Figure 70).**

Figure 69. 1884 U.S. Coast Survey Map showing the future location of the Potrero Trolley Coach Division maintenance/operations facility.
Source: David Rumsey Map Collection; annotated by Christopher VerPlanck

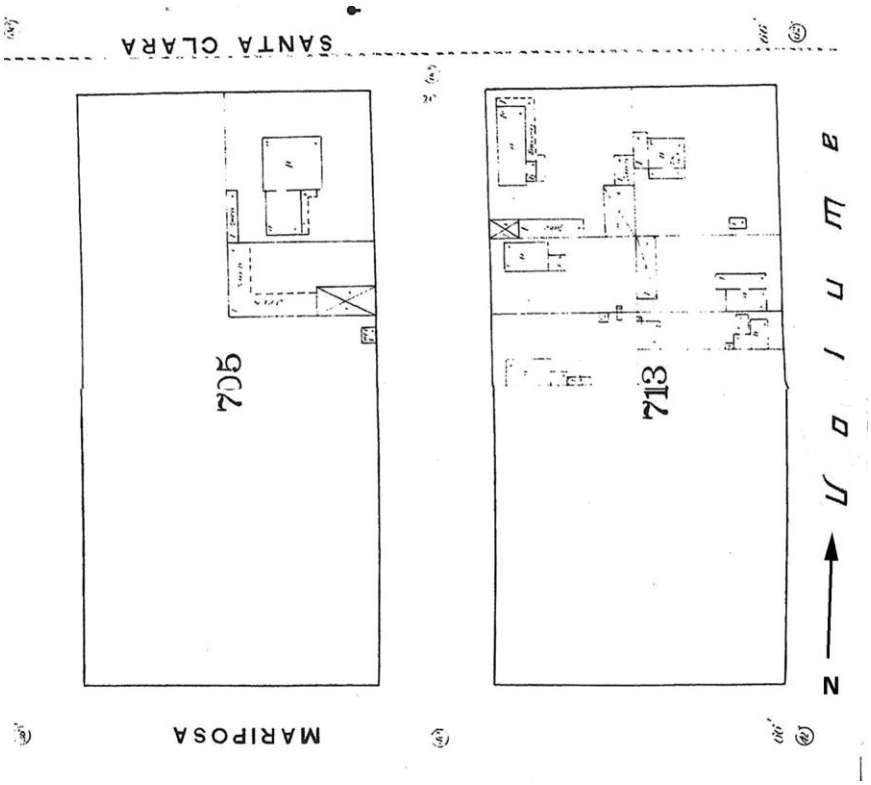


Figure 70. 1889 Sanborn Maps showing the future location of the Potrero Trolley Coach Division maintenance/operations facility.
Source: San Francisco Public Library

Published about 15 years later, the 1905 Sanborn Maps show very similar conditions to the 1889 Sanborn Maps, illustrating that semi-rural conditions continued to characterize this part of the Potrero District **(Figure 71)**. The October 1906 Block Book indicates that the majority of the two blocks belonged to an "R. O'Neill," including all of Potrero Block 41 bounded by 17th, York, Mariposa, and Bryant Streets; and the southern two-thirds of Potrero Block 48 bounded by 17th, Hampshire, Mariposa, and York Streets.

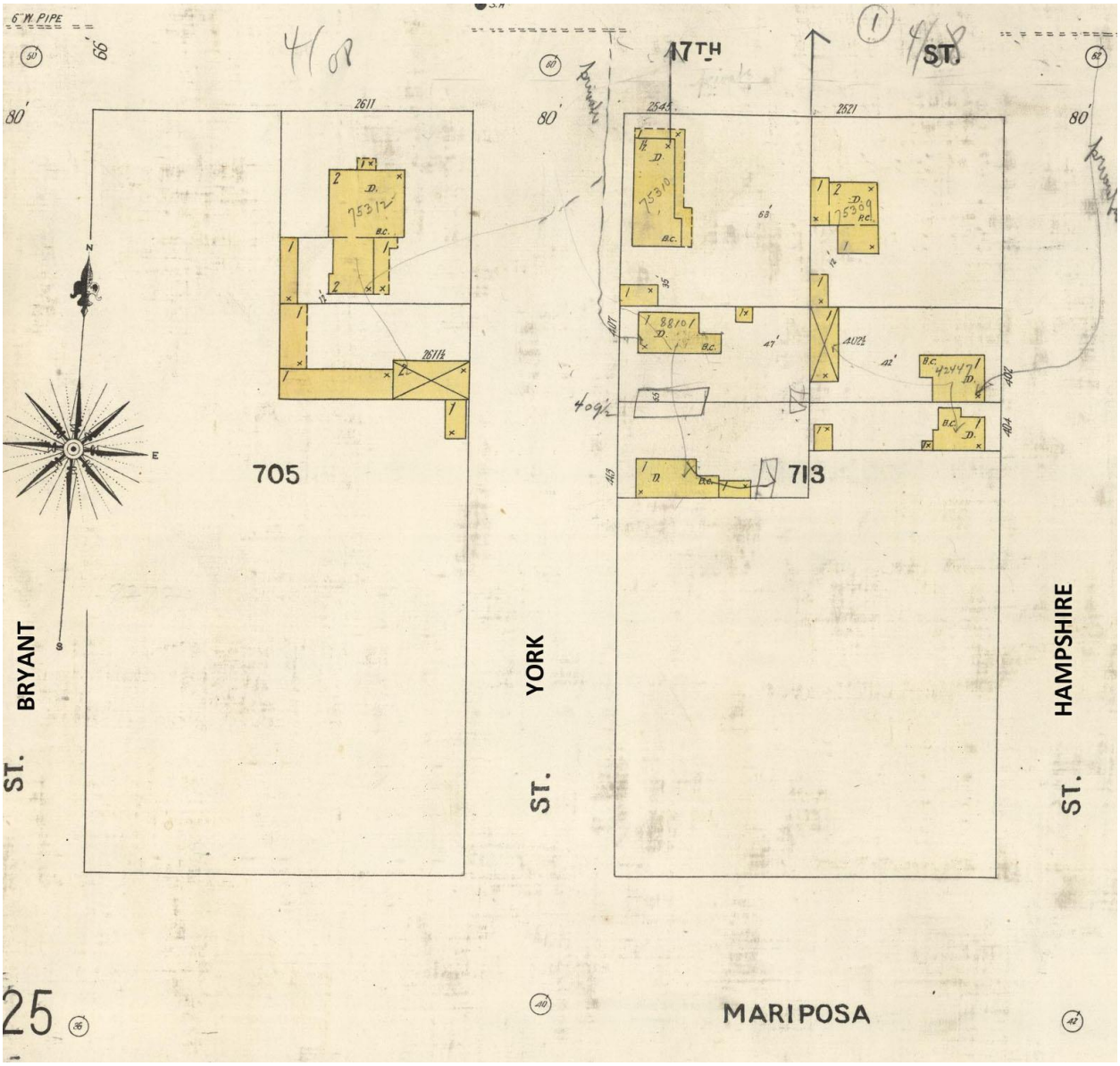


Figure 71. 1905 Sanborn Maps showing the future location of the Potrero Trolley Coach Division maintenance/operations facility.
Source: David Rumsey Map Collection

The 1914 Sanborn Maps, the last series published before the Potrero Trolley Coach Division maintenance/operations facility was built, shows startlingly similar conditions to the 1905 Sanborn Maps, with very little development beyond the previously described rural dwellings and outbuildings. However, these two blocks had lagged behind the surrounding neighborhood, which in the decade since the 1906 Earthquake and Fire had been developed with warehouses, factories, and other industrial facilities, as well as several residential enclaves. The 1914 Sanborn Maps also show that Mariposa Street, from Potrero Avenue to Florida Street, was occupied by a section of the Ocean Shore Railway's main line **(Figure 72)**. The Ocean Shore Railway was a short-lived railroad that was to link San Francisco and Santa Cruz via San Mateo County's Pacific shoreline. Its main terminal in San Francisco was located at 12th and Mission Streets.

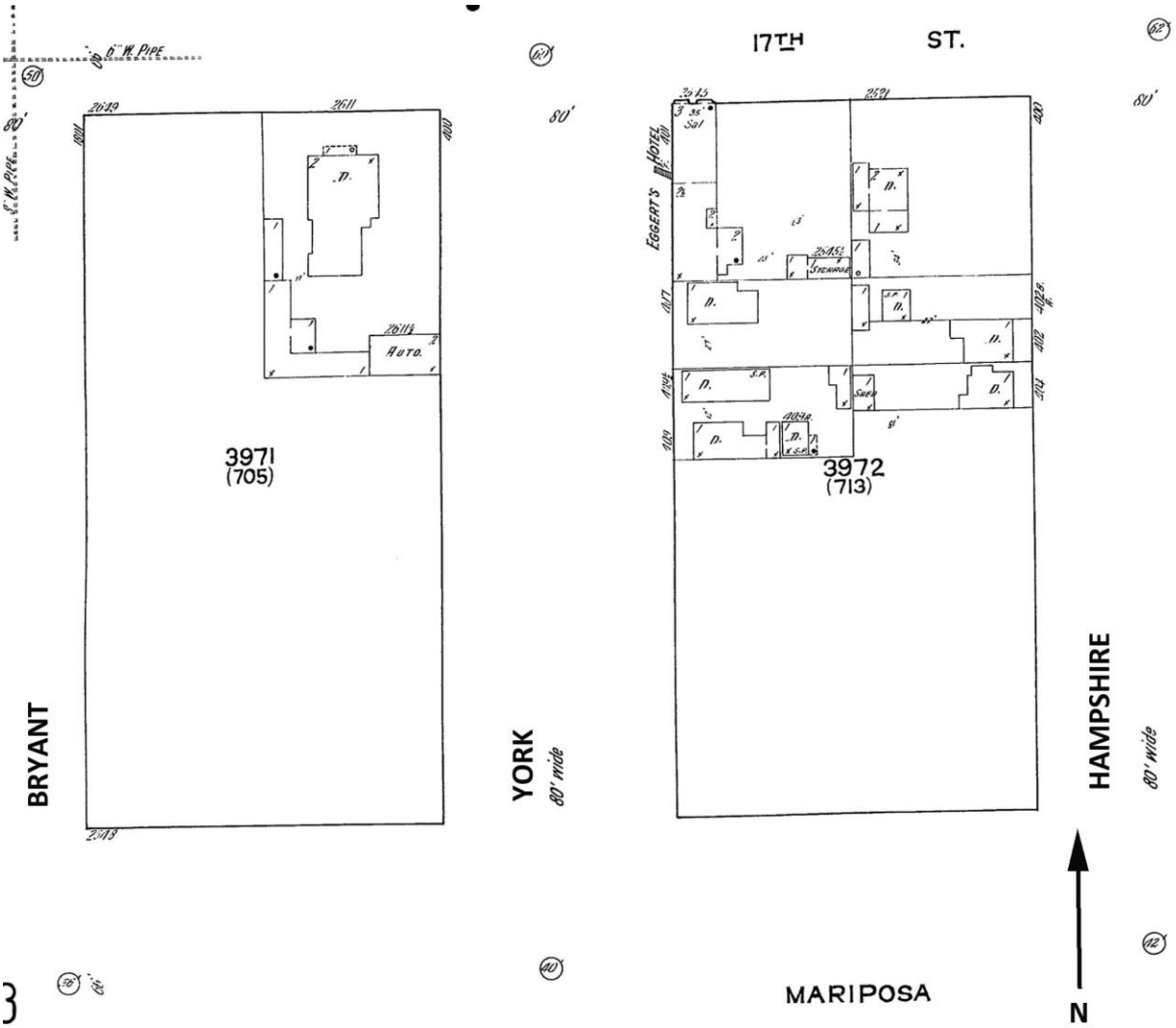


Figure 72. 1914 Sanborn Maps showing the future location of the Potrero Trolley Coach Division maintenance/operations facility.
Source: San Francisco Public Library

C. Brief History of the San Francisco Municipal Railway

The first transit service in San Francisco was a horse-drawn omnibus line that opened in 1851 to provide service between North Beach and the South of Market area. As the city grew over the second half of the nineteenth century, various other private transit providers built an informal network of horse-drawn omnibus and steam "dummy" train lines serving the core of the Victorian city. The invention of the cable car by Andrew Hallidie in 1873 revolutionized transit operations in San Francisco. Horse-drawn vehicles were never able to scale San Francisco's steep hills, and the cable car opened previously inaccessible terrain to development, allowing the city to expand westward over the steep rampart of Nob Hill and Russian Hill and into the Western Addition. The cable cars lines, like their horse-car predecessors, were privately operated companies locked into fierce competition with each other. Accordingly, service was not coordinated to serve the needs of the city's inhabitants or the expansion of the city into its rural hinterlands.

Cutthroat capitalism ensured that the weaker providers succumbed to the stronger companies, and in 1893, most of the city's cable lines were folded into the Market Street Railway Company. Further consolidation of independent lines resulted in the creation of United Railroads of San Francisco (URR) in 1901, which operated the vast majority of the city's cable car lines, as well as a growing number of faster and more dependable electric-powered streetcar lines.[9]

The URR inherited a jumbled system consisting of 234 miles of track, 56 miles of cable, and 166 miles of overhead catenaries. The rolling stock included 376 cable cars, 414 electric streetcars, 65 steam "dummy" trains, and 10 horsecars. Approximately half the cable lines had already been converted to overhead electrical lines by 1901, but many San Franciscans opposed the overhead catenaries on aesthetic grounds, preferring the more expensive option of putting them underground in slots beneath the street. The issue was quite controversial, pitting URR chief Patrick Calhoun against several of San Francisco's most powerful businessmen and politicians, including sugar baron Rudolph Spreckels and ex-Mayor James Phelan.[10] As mayor, James Phelan had overseen the creation of a new Charter for San Francisco, which encouraged the "municipalization" of city services, including water delivery, electrical power, and transportation, and he had no interest in helping the URR.[11]

While the URR was pressing forward with its plans to convert most of its remaining cable car lines to streetcars, its representatives were giving regularly scheduled bribes to Abraham "Boss" Reuf, the power behind the new Union Labor Party mayor, Eugene Schmitz, to smooth the way for overhead catenaries. Even before these payoffs became widely known during the Graft Trials of 1907-08, opponents decided to organize a rival municipal transit company to demonstrate that undergrounding electrical wires was both feasible and aesthetically superior. On April 17, 1906, one day before the 1906 Earthquake, Rudolph Spreckels and his father Claus filed papers with the State of California incorporating the Municipal Street Railways of San Francisco.[12] More of a political move than a concrete attempt to form a municipal transit company, the incorporation nonetheless signaled the City's desire to end the near-monopoly of the URR in the near future.

[9] "Our History," Market Street Railway: https://www.streetcar.org/about-sfmsr/our-history/, accessed July 5, 2017.
[10] Chris Carlsson, "United Railroads," FoundSF: http://www.foundsf.org/index.php?title=United_Railroads, accessed July 5, 2017.
[11] Anthony Perles, *The People's Railway* (Glendale, CA: Interurban Press, 1981), 15.
[12] Perles, 16.

The 1906 Earthquake and Fire laid to waste San Francisco and put the URR's system temporarily out of commission. The URR was, however, able to restore service on several lines, beginning with the 22 Fillmore streetcar line. However, the URR was an extraordinarily unpopular company, and opposition to it only grew as news got out about the bribes, as well as a strike against the company by its motormen in 1907, which killed 31 people and injured over 1,000 – mostly at the hands of thugs hired by Calhoun to break the strike.[13] Collective outrage against the URR fueled support for two bond issues put before San Francisco voters in 1909. Combined, the bond issues proposed to build a streetcar line on Market Street from the Ferry Building to Geary Street, and then all the way out to Ocean Beach on Geary. Both bonds passed, and despite political and legal maneuvering by the URR to derail the bond sales, construction got underway in June 1911. For this line, San Francisco's Municipal Railway (Muni) was able to use some existing infrastructure built by the defunct Geary Street, Park & Ocean Railway, augmenting existing tracks on Geary Street with extensions to Golden Gate Park, Ocean Beach, and the Ferry Building.[14] In addition to the Geary trunk line, which would become the spine of Muni's A, B, and C streetcar lines, the project included building a new car barn at Presidio Boulevard and Geary Street to house Muni's initial fleet of 10 streetcars, as well as Muni's management offices. The Geary Car Barn, as it was known, was designed by the Office of City Engineer Michael M. O'Shaughnessy in blend of the Renaissance Revival and Mission Revival styles **(Figure 73)**. Service began on the system's Geary Street line on the December 28, 1912.[15]

Figure 73. Geary Car Barn, June 23, 1921.
Source: SFMTA Photography Department and Archive, Image No. W07110

[13] Perles, 16.
[14] Perles, 19.
[15] Perles, 24.

The opening of the San Francisco Municipal Railway in December 1912 was a momentous occasion. In addition to its status as the United States' first publically owned transit system, the founding of Muni initiated the municipalization of several other services in San Francisco – a primary goal of the 1900 Charter. With other cities looking on, San Francisco's Municipal Railway was under a lot of pressure to expand the system quickly so that it could complete against the hated URR. Mayor James "Sunny Jim" Rolph understood the responsibilities that the City had taken on with this project, stating in his opening day speech that the Geary Street line was only the beginning:

> It is in reality the people's road, built by the people and with the people's money. The first cable road in the country was built in San Francisco, and now the first municipal railway of the country is built in San Francisco. Our operation of this road will be closely watched by the whole country. It must prove a success! We must run it by proper methods. When we have it built from the Ferry to the Ocean, it will be the best single route in the City, and we must extend it wherever possible, until it becomes a great municipal system. I want everyone to feel that it is but the nucleus of a mighty system of streetcar lines which will someday encompass the entire city.[16]

Over the next year, Muni completed its Geary Street lines but as soon as they were open, Muni turned its attention toward the vast working-class districts South of Market Street, which had traditionally received short shrift from private transit providers. Under the direction of Muni Superintendent Bion J. Arnold, with City Engineer Michael M. O'Shaughnessy assisting, Muni developed a masterplan entitled: *Report on the Improvement and Development of the Transportation Facilities of San Francisco*. This document, published in March 1913, guided the expansion of the system and the construction of its infrastructure for the next 15 years.[17]

Between 1913 and 1915, Muni began a huge expansion campaign designed to connect Downtown to the site of the upcoming Panama Pacific International Exposition (PPIE) in the Marina District. This effort resulted in the acquisition of the Presidio & Ferries Railroad, whose line ran from just north of the Ferry Building to the Presidio via The Embarcadero, Washington Street, Columbus Avenue and Union, Larkin, Vallejo, Franklin, and Greenwich Streets. After acquiring the line in early 1914, City Engineer O'Shaughnessy oversaw its conversion from a cable line to an electric streetcar line. Opening February 10, 1915 as the E line, it was Muni's third completed line.[18]

So far, Muni had depended on acquiring existing independent street railroads to expand its system. In 1914, it began building its first all-new lines, including the D, E, and H lines. The H line, Muni's first cross-town line, ran from Van Ness Avenue and Bay Street, down Van Ness to Market Street. From there it would continue south along 11th Street and Division Street to Potrero Avenue. At Potrero Avenue, it shared the Ocean Shore Railroad's track as far south as 25th Street, with a dogleg on Mariposa Street to access Muni's planned second car barn at Mariposa and Hampshire Streets. The D line was built at the same time. Beginning at the Ferry Building, it utilized existing tracks along Geary Street and Van Ness Avenue to Chestnut Street, where it turned west to access the PPIE site.[19] Another line built to serve the PPIE was the F line, which ran from Market Street to Stockton Street, and then along Columbus Avenue,

[16] Mayor James Rolph, as quoted in Perles, 27.
[17] Perles, 31.
[18] Perles, 37-38.
[19] Perles, 38-39.

North Point Street, Van Ness Avenue, and Laguna, Chestnut, and Scott Streets. The Stockton Street Tunnel, designed by City Engineer Michael O'Shaughnessy, was an important part of this project, allowing the F line to travel at a level grade beneath Nob Hill.[20]

In less than three years, the San Francisco Municipal Railway had grown from just one line running on Geary Street to seven lines, including the A, B, C, D, E, F, and H, with another line, the J Church, under development to provide a connection from Market Street to Noe Valley via Church Street **(Figure 74)**. Muni owned two car barns, including the original Geary Car Barn at Geary Street and Presidio Boulevard, as well as a new car barn at Mariposa and Hampshire Streets that was intended to serve the south of Market Street lines. Over the next few years, Muni would undertake its most expensive and technically audacious project: the construction of the Twin Peaks Tunnel from Castro and Market Streets to the still largely rural residential area West of Twin Peaks. This project, completed in 1918, included the construction of San Francisco's first subway tunnel and two stations at Eureka Valley and Laguna Honda Boulevard (now Forest Hill Station). The Twin Peaks Tunnel provided the infrastructure for several new lines serving the West of Twin Peaks neighborhoods, including the K, L, and M lines. Several years later, Muni built another tunnel beneath Buena Vista Park, the Sunset Tunnel, to access the Haight-Ashbury and Sunset neighborhoods. This tunnel provided the necessary link for the N Judah line.

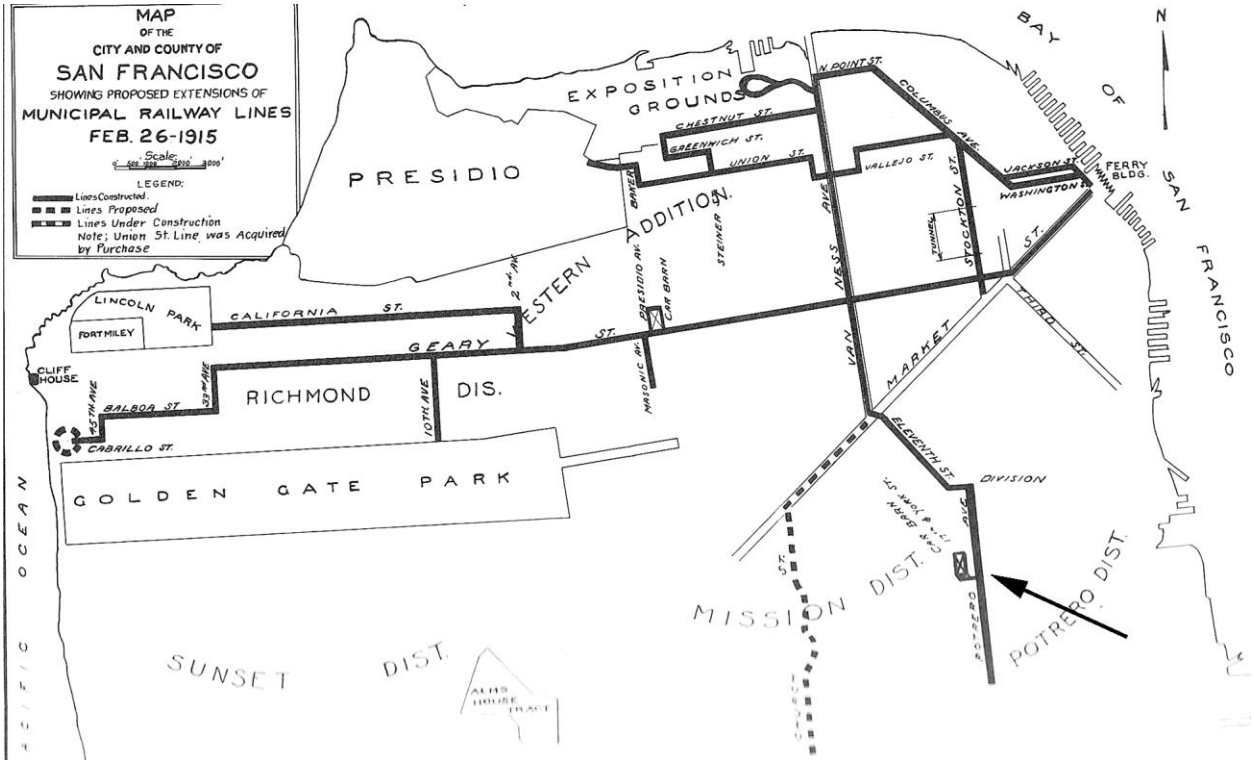


Figure 74. Muni system map, 1915. Location of proposed Potrero Car Barn indicated by black arrow.
Source: Anthony Perles, *The People's Railway.*

[20] Perles, 43.

D. Design and Construction of the Potrero Car Barn: 1913–1915

Muni's proposed H line was very popular with many civic organizations in the neighborhoods south of Market Street, including the Mission Promotion Association (MPA), which had originally suggested the Potrero Avenue alignment.[21] As mentioned previously, the H Line project included a car barn on or near Potrero Avenue to serve it, as well as any additional lines built south of Market Street. A $3.5 million bond approved by San Francisco voters in a special election held on August 26, 1913 funded both the H line and the car barn. Incidentally, this was Muni's second major victory at the polls, suggesting that voters approved of its goals to extend its service area beyond the Geary Street corridor. In addition to funding the H line and the Potrero Car Barn, this bond funded the construction of the E and F lines and preliminary engineering work for the proposed J line on Church Street.[22]

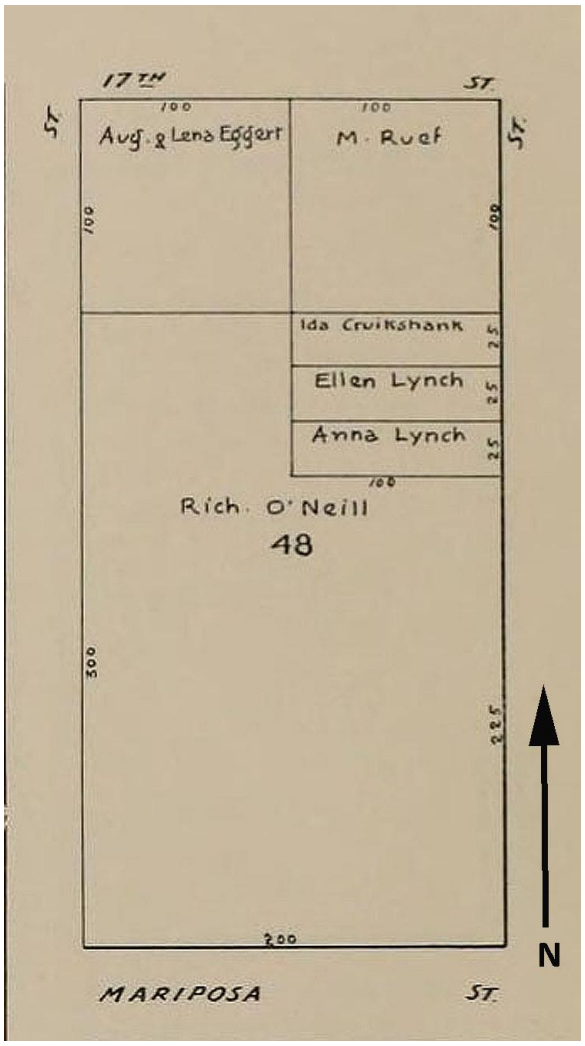


Figure 75. 1909 San Francisco Block Book showing Potrero Block 48.
Source: San Francisco History Center, San Francisco Public Library

Following passage of the bond, Muni manager Bion J. Arnold began looking for a site for a car barn in the Potrero District. A very large site was necessary because the facility had to accommodate 100 streetcars.[23] In October 1913, the City entered into negotiations with John Center to purchase two adjoining parcels on the east side of Potrero Avenue, between 18th and 19th Streets. Within a month, negotiations ended abruptly, and on December 14, 1913, the City purchased the first of six lots on Potrero Block 48 bounded by 17th, Hampshire, Mariposa, and York Streets **(Figure 75)**.[24] The City began by buying two 100' x 100' lots on 17th Street from August and Lena Eggert and M. Reuf, respectively, for $85,000.[25] One month later, in January 1914, the City purchased two 25' x 100' house lots on Hampshire Street from Ellen and Anna Lynch for $28,606.[26] On July 2, 1914, the City then bought the southern two-thirds of Block 48 from the Estate of Richard O'Neill and John and Alice T. McDade.[27] It is not known when the City bought the remaining 25' x 100' house lot from Ida Cruikshank on Hampshire Street.

[21] "Mission Asks for More Railroads," *San Francisco Chronicle* (March 5, 1913), 9.
[22] "Little More than Week Left to Register for Coming Election," *San Francisco Chronicle* (July 16, 1913), 11.
[23] "Quick Track Work Promised by City," *San Francisco Chronicle* (September 4, 1913), 13.
[24] "Planning for New City Car Lines," *San Francisco Chronicle* (October 1, 1913), 5.
[25] "Estimates Cost of New City Railway Lines," *San Francisco Chronicle* (December 14, 1913), 21.
[26] "Property Owners to Pay for City Railway Paving," *San Francisco Chronicle* (January 23, 1914), 16.
[27] San Francisco Office of the Assessor-Recorder, Sales Ledger Records for APN 3971/001.

Excavation for the Potrero Car Barn got underway in July 1914, with the Daniel O'Day Co. winning the contract with a low bid of $34,850.[28] The work was arduous because it involved blasting many tons of serpentine to bring the entire site down to grade along Mariposa Street. In late 1914, the Board of Public Works requested bids from contractors to construct the first floor level of the car barn. In December, it received 12 bids and awarded the contract to Clinton Fireproofing Company, which submitted the lowest qualified bid of $196,000.[29] Clinton Fireproofing completed the building ahead of schedule in May 1915 and because of this, was awarded a substantial bonus of $400 per day that it came in ahead of schedule.[30]

Figure 76. Potrero Car Barn under construction, 1915.
Source: SFMTA Photography Department and Archive, Image No. W02557

As shown in historic photographs, the newly completed Potrero Car Barn was originally a one-story, flat-roofed concrete shed with a modest amount of ornament on its exterior. The primary façade faced Mariposa Street, where curved tracks entered the building through seven vehicular bays **(Figure 76)**. Additional streetcars could be stored on the roof, which was accessed by a spur track running along 17th Street. The building, designed by the Office of the City Engineer, Michael M. O'Shaughnessy, was rendered in the Renaissance Revival style, with Tuscan pilasters separating the vehicular bays and bracketed architraves capping the corner bays facing Mariposa Street, as well as the main pedestrian entrance on Hampshire Street. The building was clearly designed to accept another story because the windowsills for the future

[28] "Contracts Given by Works Board," *San Francisco Chronicle* (July 14, 1914), 5.
[29] "California Street Municipal Railway and Another Car barn to be Built," *San Francisco Chronicle* (December 3, 1914), 5.
[30] "Municipal Car Barn Contract Completed," *San Francisco Chronicle* (May 9, 1915).

office addition are clearly visible in early photographs of the original one-story building. The interior of the building was simple, consisting of maintenance bays used for repairing, maintaining, and storing off-duty streetcars. Additional storage space was located on the roof, although it was not covered, which was a necessity during the rainy season with the open-ended streetcars that Muni originally used. The interior also contained a supervisor's office at the southeast corner of the building, several shops along the north side of the building, and toilet rooms and locker rooms beneath the sidewalk along Hampshire Street.

E. Operational History of the Potrero Car Barn: 1915–1949

Second Floor Additions: 1924

In the summer of 1915, the Board of Public Works requested the Department of Architecture to complete plans and specifications for several second story additions to be built atop the Potrero Car Barn. In addition to an office wing facing Mariposa Street, plans included two shop additions along Hampshire Street, increasing the number of streetcars that could be stored on-site.[31] However, the second floor additions were put off for a decade, presumably because funds were not available. When the funds were finally disbursed in October 1924, the work was estimated to cost $140,000. The work was completed by the firm of Vukicevic & Baggo, which submitted the low bid.[32] Original drawings do not survive, so it is not known whether the additions were built as they were originally designed in 1914 or whether they were modified. Based on their simplified cornice detailing, as well as the addition of some Mediterranean detailing on the parapet, it seems possible that the design was slightly modified. The second floor office addition at the front of the building was built for the Operations Department, including a dispatch office, locker rooms, toilet rooms, and a Gilley room. Meanwhile, the second floor shop additions were built for the Maintenance Department.

Historic photographs taken of the Potrero Car Barn after 1924 show a facility that superficially resembles what exists today, especially the Mariposa Street façade. The new second floor office wing looked virtually exactly as it does today, with seven bays – each of which contains three pairs of double-hung metal windows – a modest cornice, and re-entrant corners to match the first floor level. The only difference between what is shown in historic photographs and what exists today is that the original tiled parapet coping was removed in 1989-90 **(Figure 77)**. Meanwhile, the second floor shop additions along Hampshire Street were largely windowless, utilitarian structures with simplified detailing designed to harmonize with the Mariposa Street façade. Originally, the second floor shop additions extended all the way from the rear wall of the office wing to the corner of 17th and Hampshire Streets **(Figure 78)**. A sign above the eastern-most bay read "MUNICIPAL RAILWAY A.D. 1924." The shops were later reduced in length in 1948-49 when the Potrero Car Barn was converted into a trolley coach facility. Spur tracks branching off a line running along 17th Street accessed the shops, as well as a parking deck on the second floor level.

[31] *Building & Engineering News* (June 20, 1915).
[32] "Official Advertising: Resolution No.___" *San Francisco Chronicle* (October 18, 1924), 25.

Figure 77. Mariposa Street façade of Potrero Car Barn, May 12, 1926.
Source: SFMTA Photography Department and Archive, Image No. W10351

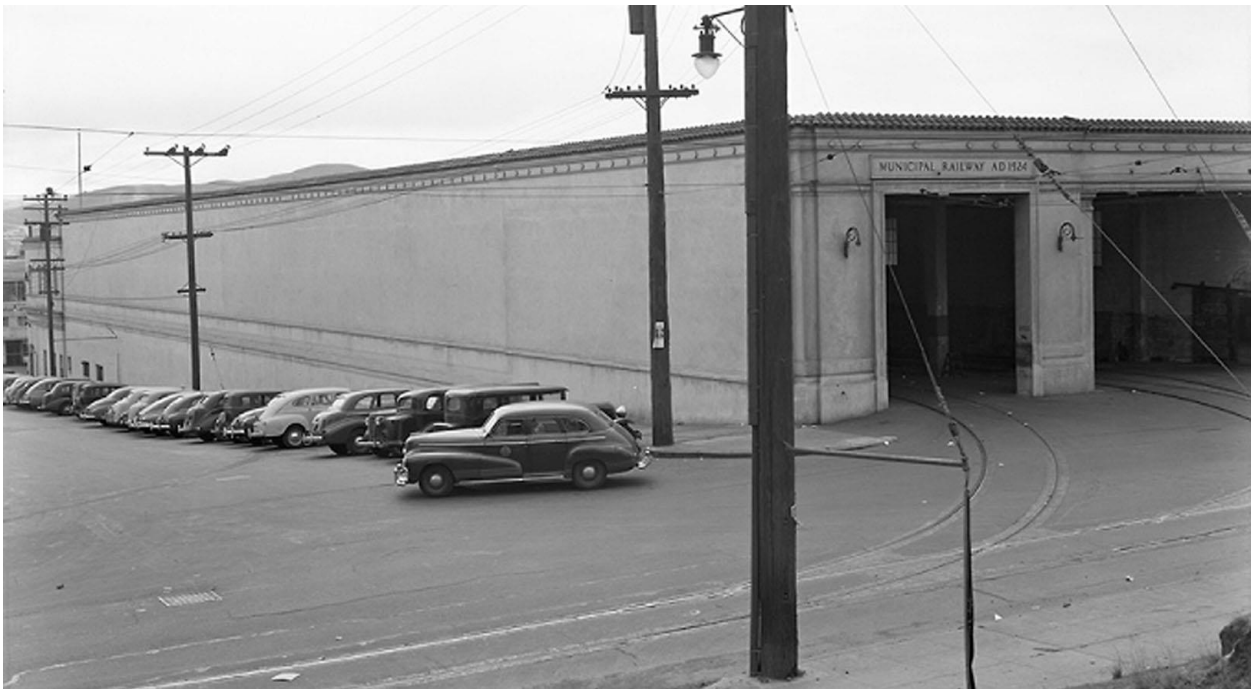


Figure 78. Hampshire and 17th Street façades of Potrero Car House, November 16, 1948.
Source: SFMTA Photography Department and Archive, Image No. D5486

Changes to Muni Service: 1925–1941

The heyday of San Francisco's Municipal Railway was 1912 to 1925. Led by the able Bion J. Arnold, with technical and political support from City Engineer Michael O'Shaughnessy and Mayor James Rolph, respectively, plans were made to expand Muni's streetcar lines throughout the city. However, two factors began to reduce public support for expansion: what to do with the Market Street Railway, and the overall expense of expanding and maintaining the growing system. As it may be recalled, when it was founded, Muni's main private competitor was the United Railroads of San Francisco (URR). Following a decade of corruption, labor strife, and several high-profile accidents, the URR reorganized in 1918 under its old name, the Market Street Railway. The Market Street Railway continued to operate several streetcar lines, the Powell Street cable car system, and a growing fleet of buses. However, as its franchises expired, the Board of Supervisors did not renew them, hoping to pressure the Market Street Railway's management to sell the system to the City. Somewhat perversely, this policy convinced many San Franciscans that spending money on expanding Muni was a waste of money if it was eventually going to absorb the extensive Market Street Railway network. Another factor that diminished public support for Muni was its high cost, especially the cost of building expensive streetcar tunnels to the West of Twin Peaks neighborhoods. The upshot of these concerns was a stunning defeat for Superintendent Arnold's plans for a "Greater Muni," when voters failed to pass a $4.6 million bond issue in November 1927.[33]

The early 1930s witnessed a continued slowdown of Muni's expansion. The passage of the 1931 Charter made several changes to local government, including reducing the near-absolute authority of powerful department heads like City Engineer Michael O'Shaughnessy. O'Shaughnessy, who had been instrumental in overseeing the construction of the Hetch Hetchy water system, San Francisco Airport, the Twin Peaks and Sunset Tunnels, the Municipal Railway, and many other important infrastructure projects, was forced into retirement in 1932. Mayor Rolph's resignation to take up the governorship in 1930 had already weakened support for Muni. Since taking office in 1912, Mayor Rolph had been a huge proponent of public works in general and public transit in particular.[34] Although his successor, Angelo Rossi, was also a supporter of Muni, he had a much less grandiose vision than Rolph did, and Rossi refused to spend money that the city did not have, especially during the Depression. [35]

In addition to flagging political support, Muni suffered from its own internal problems. Beyond its age-old rivalry with the Market Street Railway, which Muni did not absorb until 1944, Muni had begun experiencing substantial operational deficits. These deficits were mainly the result of growing private automobile use, especially in the West of Twin Peaks neighborhoods, where Muni had spent so much money tying into the city's transit network. Indeed, falling ridership in the Richmond District forced Muni to abandon its first streetcar line in 1932, the A line, which ran along 10th Avenue from Geary Boulevard to Golden Gate Park.[36]

Faced with myriad problems, Muni began looking into ways to speed up service and reduce costs, including skipping every other stop in the Sunset and Richmond Districts and replacing certain lines with bus service. Buses had always played a role in Muni's operations, but mainly as neighborhood "feeder" routes. However, by the 1930s, Muni began substituting bus service for new streetcar lines. In addition to much lower capital costs, buses were cheaper to run because they only required one person, a driver; streetcars

[33] Perles, 99.
[34] Perles, 101.
[35] Perles, 102.
[36] Perles, 102.

required a motorman and a ticket taker. Buses were also easier to re-route and better on steep hills, where streetcars could not operate without expensive tunneling or right-of-way acquisitions. Between 1935 and 1944, Muni added very little new trackage but 43 miles of new bus routes and 6.8 miles of "trackless" trolley coach service.[37]

Potrero Car Barn in the 1930s

Despite the increases in bus service, Muni had not cut many streetcar lines yet, so no substantial changes were made to the Potrero Car Barn between 1924 and 1940. Throughout this time, the facility continued to serve as Muni's primary streetcar storage and maintenance facility south of Market Street. Moreover, unlike the suburban Sunset or Richmond Districts, where auto ownership and usage had grown significantly during the 1920s and 1930s, the Mission and Potrero Districts remained working-class, transit-oriented communities. Accordingly, demand for Muni's local streetcar lines remained strong throughout these decades.

A series of aerial photographs taken of San Francisco in 1938 by Harrison Ryker illustrate the Potrero Car Barn property before the first major changes were made in the early 1940s **(Figure 79)**. The photographs indicate that the facility had not been changed since the 1924 additions had been completed, which are visible as an L-shaped mass on the roof of the original one-story building. The facility was still confined to the block bounded by 17th, Hampshire, Mariposa, and York Streets. However, in June 1925, the City had acquired the southern half of Potrero Block 41 from Olaf, Arne, Charles, and Nellie Monson for use as a corporation yard.[38] The 1938 aerial photographs indicate that this 200' x 200' property was used to store rails, light standards, machinery, trucks, and various equipment. It also contained several corrugated metal sheds. A curved section of track accessed it from Mariposa Street.

Figure 79. 1938 aerial photograph showing Potrero Car Barn (right) Muni Corporation Yard (lower left).
Source: David Rumsey Map Collection

[37] Perles, 107.
[38] San Francisco Office of the Assessor-Recorder, Sales Ledger Records for APN 3971/001.

Trolley Coach Shop Addition: 1940–1941

By the late 1930s, Muni management and the newly founded Public Utilities Commission (PUC) began making plans to introduce trolley coaches to the Potrero Car Barn facility. As a preliminary step, the PUC entered into negotiations to purchase the northern half of Potrero Block 41 adjoining Muni's corporation yard for a future trolley coach yard. This property, which measured 200' x 200', contained a large Victorian farmhouse and several rural outbuildings. On July 26, 1939, the PUC bought the property from Katherine Fagothy and Margaret McDade.[39] With this purchase, the City owned Potrero Blocks 41 and 48 in their entirety. In 1940, the PUC asked the Board of Supervisors to vacate the one block section of York Street between Mariposa and 17th Streets. Shortly thereafter, the PUC merged the two adjoining blocks and the right-of-way into one property: APN 3971/001.

In 1940, the PUC decided to build a trolley coach maintenance shop atop the roof of the Potrero Car Barn. Built to the west of the two existing streetcar maintenance shops, the reinforced-concrete addition consisted of a full-height shop and a lower section containing offices and storage rooms **(Figure 80)**. Although its design was loosely based on the original Potrero Car Barn, the addition adhered to a more stripped-down industrial vocabulary in keeping with changing tastes.

Figure 80. 1940-41 Trolley Coach maintenance shop addition to the Potrero Car Barn, August 25, 1941.
Source: SFMTA Photography Department and Archive, Image No. D4675

Potrero Car Barn in the 1940s

The trolley coach shop addition was completed not long before the U.S. entry into World War II. Any other anticipated changes to the Potrero Car Barn, as well as the construction of a bus yard on the western half of the site, were put on hold for the duration of the war. In addition to steel and concrete being rationed

[39] San Francisco Office of the Assessor-Recorder, Sales Ledger Records for APN 3971/001.

for the war effort, Muni's streetcar ridership surged as an influx of defense workers moved to San Francisco to take jobs in local shipyards and defense plants. In 1944, Muni also finally absorbed the Market Street Railway. These developments resulted in the postponement of any plans to curtail streetcar service or replace any active streetcar lines with bus service.[40]

Conversion of Streetcar Lines to Trolley Coaches: 1945–1949

Unfortunately for Muni, the conclusion of World War II did not bring sustained ridership. With rationing of gasoline and rubber over, many San Franciscans enthusiastically took to their cars. Suburbanization was another factor; during the immediate postwar era, many San Franciscans moved out of the dense, transit-rich inner city into the sprawling Sunset and Parkside Districts, where Muni service was sparse. The eventual exodus of thousands of more San Franciscans out of the city altogether even more negatively affected Muni's ridership levels. Compounding these trends was auto congestion, which slowed nearly all of Muni's lines, most of which were, and remain, mixed with auto traffic.

The abandonment of public transportation in favor of private automobiles was not unique to San Francisco; declining rates of transit ridership affected nearly every American city during the postwar period. As Muni's fare box receipts declined, the transit agency entered a period of retrenchment that resulted in major changes to its operations.[41] In search of ways to streamline service and save money, the PUC hired Leonard Newton, former vice-president of the Market Street Railway, to develop a new postwar master plan. The Newton Plan, as it was known, was published in 1945. Its primary goals were to eliminate duplicative lines resulting from the 1944 merger; reconfigure the remaining lines to create a "hub and spoke" system to feed commuters from outlying neighborhoods into Downtown; and replace the agency's aging rolling stock with 313 new PCC streetcars, 223 new trolley coaches, and 215 buses.[42]

Two years later, Mayor Roger Lapham convened the Administrative Transportation Planning Council to conduct additional long-range transportation planning in San Francisco. The resulting plan, *Transit History of San Francisco, 1850-1948*, was similar to the Newton Plan in its recommendations, although the latter study called for a more drastic reduction in streetcar service. Embracing the plan's recommendations, Mayor Lapham put a $20 million bond on the 1947 ballot to "modernize" Muni by replacing fixed-rail streetcars with trolley coaches.[43] The PUC also hired Colonel Marmion D. Mills, onetime regional sales manager for General Motors' Yellow Coach bus manufacturing division, to oversee the dismantling of San Francisco's streetcar lines, a service he infamously provided to several cities. Voters approved the 1947 transit bond and in 1948-49, Muni began abandoning streetcar lines *en masse* and converting all or parts to bus or trolley coach service.[44]

Although the "Lapham Plan" would have eventually eliminated all streetcar service in San Francisco, as most other major American cities had done, San Francisco's challenging topography saved the streetcar from extinction because neither the Twin Peaks Tunnel nor the Sunset Tunnel could accommodate two buses going in opposite directions. Lines dependent on these tunnels, including the K, L, M, and N lines, were therefore preserved. Similarly, the J line's contour-hugging right-of-way from 18th to 22nd Streets was also too narrow for non-fixed wheel vehicles, sparing this line as well.[45]

[40] Perles, 128.
[41] Perles, 133.
[42] Perles, 134.
[43] Perles, 135.
[44] Perles, 175.
[45] Perles, 181.

Conversion of the Potrero Car Barn to Trolley Coaches: 1948–1949

Using 1947 bond funds, the PUC commissioned the Utilities Engineering Bureau to develop plans to convert the Potrero Car Barn into a trolley coach facility. The car barn itself would be kept and remodeled, with the rest of the site built out as a bus yard. The project entailed significant changes to the former car barn, including removing all ornament and replacing all fenestration along the west façade facing the bus yard **(Figure 81)**. At 17th and Hampshire Streets, the project entailed demolishing the 1940-41 trolley coach shop, demolishing approximately 50 percent of the 1924 streetcar maintenance shop additions, building a concrete wall to enclose the gap created by demolishing the shops, and building a new control room. Additional changes to the former car barn included removing all streetcar tracks, reconfiguring the interior with new offices and shops, and rebuilding the roof to accommodate a parking deck. The office wing was also altered, including remodeling the interior and modifying three vehicular bays on the Mariposa Street façade. The westernmost bay was infilled with concrete and a roll-up. The next bay was infilled with Gunite and plaster and a pedestrian entrance inserted in the opening to access the new offices inside the building. Meanwhile, the easternmost bay along Mariposa Street was widened, resulting in the demolition of the original decorative doorframe. Other changes to the office wing included infilling several windows on the west façade and adding a new medallion with Muni's logo to the second floor level facing Mariposa Street.

Figure 81. Reconstruction of west façade of Potrero Car Barn, 1949.
Source: SFMTA Photography Department and Archive, Image No. X1930

The construction of the bus yard entailed the demolition of the large Victorian dwelling on 17th Street and the ca. 1925 Muni corporation yard on Mariposa Street, regrading the entire site level with Mariposa Street, constructing a high "rip-rap" retaining wall along Bryant and 17th Streets, paving the yard in asphalt, striping the bus yard with parking stalls, and installing electrical poles, catenaries, and maintenance equipment **(Figure 82)**.

The conversion of the Potrero Car Barn into the Potrero Trolley Coach Division maintenance/operations facility was complete by summer 1949. Other projects completed around the same time in support of the changeover from streetcar to bus service included the modernization of the Ocean Avenue Bus Yard and the construction of an addition onto the Geary Car Barn for trolley coach storage.[46] All of this work was paid for from the 1947 bond funds and timed to coincide with the arrival of 53 new trolley coaches built by the Twin Coach Company of Kent, Ohio at a cost of $1,000,000.[47]

Figure 82. Appearance of the Potrero Trolley Coach Division Facility following 1949 remodel.
Source: SFMTA Photography Department and Archive, Image No. X2104

[46] "New Muni Changes Coming: One July 3 City will Drop Six Car Lines…Start Five Bus, Five Trolley Coach Lines," *San Francisco Chronicle* (April 7, 1949), 2.
[47] Ray Leavitt, "53 Trolley Buses Arrive….Below Par," *San Francisco Chronicle* (April 7, 1949), 2.

F. Operational History of the Potrero Trolley Coach Division: 1950–2017

One year after the 1948-49 conversion of the Potrero Car Barn into the Potrero Trolley Coach Division maintenance/operations facility, the property was depicted on the 1950 Sanborn Maps. The maps show the new bus yard occupying the western portion of the site and the former York Street right-of-way. The 1950 Sanborn Maps also show the former Potrero Car Barn reconfigured for electric trolley coaches. The floor plan, which is shown on the maps, is similar to what exists today, with the maintenance bays, shops, offices, and storage rooms occupying the first floor level and offices, dispatch rooms, and Gilley room occupying the second floor of the office wing **(Figure 83)**. Notes on the maps indicate that staff toilet rooms and locker rooms were still located beneath the sidewalk along Hampshire Street. Notes indicate that the transformer vault was located near the north end of the west façade. In contrast to today, the maps show only two maintenance pits inside the building. The 1950 Sanborn Maps do not show the storage rooms that are now located along the north side of the maintenance facility or the smaller shops that are located along the west side of the building.

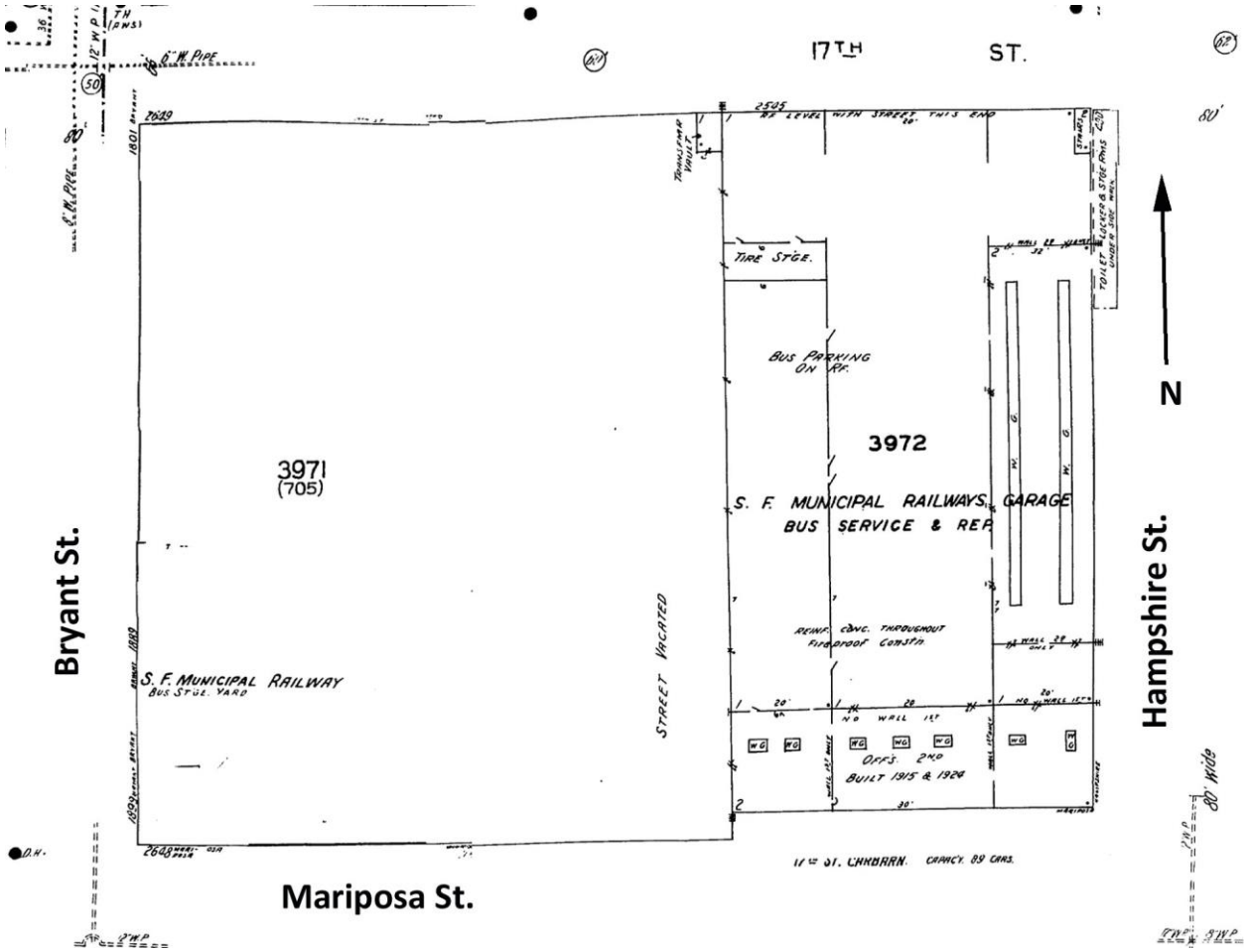


Figure 83. 1950 Sanborn Maps showing the Potrero Trolley Coach Division maintenance/operations facility.
Source: San Francisco Public Library

Potrero Trolley Coach Division Facility: 1949–1989

Between 1949 and 1989, very little of note occurred at the Potrero Trolley Coach Division maintenance/operations facility, which continued to serve as Muni's primary trolley coach facility south of Market Street. Lawrence G. Marshall was the first Superintendent of the facility, commonly known simply as the "Potrero Division." He had previously run the Potrero Car Barn, taking that position in 1939, a year before the first trolley coach shop was built on the site. Marshall retired in 1948, during the conversion of the facility to serve trolley coaches.[48] Wesley R. Mason took over in 1948, serving until 1951. George S. Lewis then ran the facility until 1965.[49] During a period in the 1970s, Joseph N. Crosley was the Superintendent of the Potrero Division.

By the late 1970s, when Crosley ran it, the Potrero Division was beginning to face an increasing amount of criminal activity, including vandalism of buses and buildings, and theft – sometimes by operators, mechanics, and other employees.[50] The 1970s and 1980s were a period of continued decline in the fortunes of San Francisco's Municipal Railway, with both the city's population and ridership in near freefall. At the Potrero Division, drinking, fighting, stealing, and other signs of low morale were frequently reported in local newspapers. These incidents were beginning to take their toll on employees and patrons of what columnist Herb Caen sometimes called the "Muniserable Railway."[51] Newspaper accounts from the 1980s describe Muni buses and facilities as being in a shambles, with broken seats, etched-up windows, and graffiti-coated interiors.

1989–1990 Remodel

With employee and passenger morale at an all-time low, Muni management realized something had to be done. During this time, Muni embarked upon improvements to several of its facilities, including rehabilitating the then 76-year-old Potrero Trolley Coach Division maintenance/operations facility in 1989-90. Changes to the bus yard included removing the existing sloped riprap retaining walls to gain additional square footage, installing new bus wash, vacuum, and fare collection stations; new asphalt and striping; and new electrical poles and catenaries. Other changes to the site included the construction of a new control "tower" near the main entrance on Mariposa Street and the enclosure of the bus yard behind a 10' metal fence to discourage vandalism and theft. Changes to the building itself included repairing cracks on the parking deck, repairing drainage systems, reconfiguring the maintenance pits, reconfiguring the heavy repair shops along the west side of the building, installing new storage areas along the north side of the building, converting the former toilet rooms under the sidewalk on Hampshire Street into offices, installing new toilet rooms along the west side of the building, and remodeling the Operations department on the second floor of the office wing. The project also included mechanical, plumbing, and life-safety upgrades. Specific changes to the exterior included reconfiguring several door and window openings along the west façade, installing a new metal storefront and signage at the main entrance on Mariposa Street, and installing five new overhead telescoping doors on the west façade. The north (rear) façade of the office wing received new pedestrian entrances and several windows were infilled. The tire shop on the second floor also received new telescoping doors.[52]

[48] "Pioneer Muni Employee will Retire Today," *San Francisco Chronicle* (November 30, 1948), 17.
[49] "New Muni Manager: Charles D. Miller to Assume Part of Scott's Duties," *San Francisco Chronicle* (January 3, 1951), 1.
[50] Ira Kamin, "Night Watch on the Muni," *San Francisco Chronicle* (August 7, 1977), 234.
[51] Herb Caen, "Ready When You Are," *San Francisco Chronicle* (December 16, 1980), 33.
[52] San Francisco Municipal Transportation Agency Plan and Permit Archive, "Muni – Potrero Division Rehabilitation," 1989-90.

The Potrero Trolley Coach Division maintenance/operations facility appears on the ca. 1990 Sanborn Maps maintained by the San Francisco Planning Department. The ca. 1990 Sanborn Maps show no significant changes to the property since the 1950 Sanborn Maps were published 40 years earlier, although it was highly unlikely that anyone went into the building to record the changes made in 1989-1990 **(Figure 84)**.

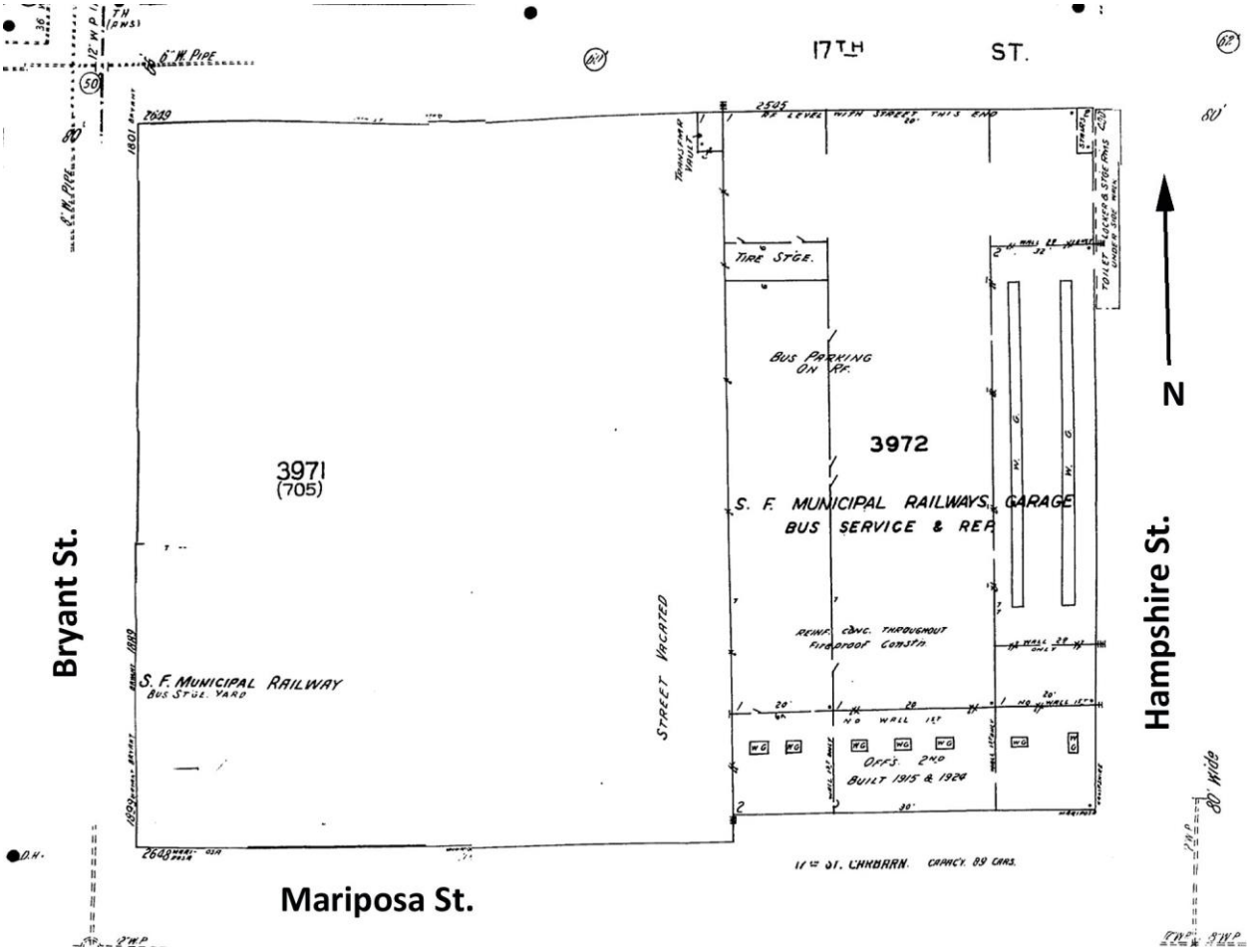


Figure 84. Ca. 1990 Sanborn Fire Insurance Co. Map showing the Potrero Trolley Coach Division maintenance/operations facility.
Source: San Francisco Planning Department

G. Alterations

Since it was initially completed as a streetcar barn over a century ago, the Potrero Trolley Coach Division maintenance/operations facility has undergone several major changes, especially in 1948-49 when the building was converted into a trolley coach maintenance facility. These changes heavily remodeled the west façade, the north façade, and portions of the interior, although the building looks substantially the same from both Mariposa and Hampshire Streets. The 1989-90 seismic retrofit/rehabilitation made additional changes to the building, although the majority of these changes occurred within the interior and on the adjoining bus yard. Since 1990, Muni has made several relatively small changes to the facility, including remodeling the fare collection shop and the electronic repair shop in 1995, reroofing the building in 1999, and completing a series of interior upgrades in 2001, including conversion of the lock shop into an electronics shop, ADA upgrades to the men's and women's toilet rooms, a battery room upgrade, renovations

to the conference room and lunch room, and enlarging the openings in the heavy repair bays along the west façade. The most recent change, which occurred in late 2015, entailed the installation of an additional electrical circuit and telecommunication equipment. All building permits on file for the property are listed below in **Table 1** and attached as **Appendix Item B** of this report. Please note, there are no permit applications for the property pre-dating 1979, suggesting that earlier work was permitted internally and not through the Department of Building Inspection.

Table 1: Building Permit Applications on File for Potrero Trolley Coach Division Facility

Application No.	Date Approved	Applicant	Scope/Cost/Builder
7902044	April 30, 1979	SF Municipal Railway	Furnish and install new washroom inside building costing $19,527. Contractor: Henry L. Chapot & Assocs.
0901540	January 14, 1991	SF Municipal Railway	Structural/seismic upgrade; remodel interior shops, maintenance, and office spaces; mechanical, electrical, and plumbing alterations costing $6,500,000. Architect: James A. Wallsten; Contractor: TBA
09025798	May 14, 1991	SF Public Utilities Commission	Install fire sprinklers in tire shop costing $12,000. Contractor: Progressive Fire Sprinkler
09507422	August 1, 1995	SF Municipal Railway	Rehabilitate fare collection shop and build new electronics shop costing $11,000. Architect: Muni Capital Engineering; Contractor: San Luis Gonzaga Construction, Inc.
09609398	May 29, 1996	SF Municipal Railway	Renew Permit Application 09507422
09902338	February 5, 1999	SF Public Transportation Commission	Install new roofing system at administration building and install new deck coating on elevated parking deck costing $1,152,595. Architect: Peter Gabancho; Contractor: Western Roofing Service
200101230430	October 2, 2001	SF Municipal Railway	Convert existing lock shop into electronics shop; ADA upgrade of men's and women's toilet rooms; battery room upgrade; conference room and lunchroom renovations; widen openings of heavy repair bay costing $348,000. Engineer: Parsons Brinckerhoff; Contractor: Jersey Contractors, Inc.
200202078692	February 7, 2002	SF Municipal Railway	Renew Permit Application 200101230430
201510169984	November 10, 2015	SFMTA	Install electrical circuit with four-gang receptacle; install antennas, cables, and fiber optics; install new control station costing $20,000. Engineer: Brian Burkhard; Contractor: Champion Telecom

H. Chief Engineer Michael M. O'Shaughnessy: 1864–1933

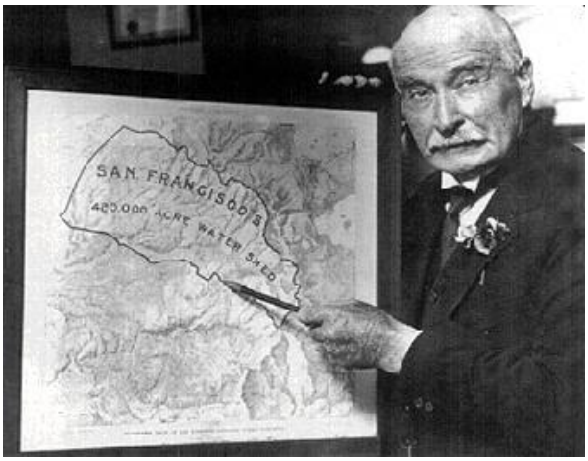


Figure 85. Michael M. O'Shaughnessy, ca. 1914
Source: San Francisco Public Library

The design and construction of the Potrero Car Barn in 1915, as well as its expansion in 1924, occurred under the direction of San Francisco's larger-than-life City Engineer, Michael Maurice O'Shaughnessy **(Figure 85)**. Michael, better known during his life as "M.M.," served Mayor James "Sunny Jim" Rolph from 1912 until 1930, when he was forced into retirement. Throughout his long tenure as San Francisco's Chief Engineer, O'Shaughnessy oversaw the completion of dozens of major public works projects–the largest sustained expansion of San Francisco's infrastructure in the city's history. Although he was responsible for dozens of well-known projects, O'Shaughnessy is today perhaps best known for his work overseeing the massive 167-mile-long Hetch Hetchy water delivery system, one of the most ambitious municipal aqueducts ever built in the United States. With this accomplishment, O'Shaughnessy is often compared with Los Angeles City Engineer William Mulholland, another Irish immigrant, who oversaw the design and construction of Los Angeles' Owens Valley Aqueduct. O'Shaughnessy is also well-known by public transit historians for his work designing and building the San Francisco Municipal Railway, America's first public transit agency.

Michael M. O'Shaughnessy was born to a farming family in County Limerick, Ireland in 1864. He studied at University College in Cork and in Galway, before graduating with honors in Engineering from the Royal University of Dublin in 1884.[53] In 1885, O'Shaughnessy came to the United States, arriving in San Francisco on March 30 of that year. In 1886, the Southern Pacific Railroad hired O'Shaughnessy as a surveyor. In 1889, he opened his own practice, specializing in land surveying and hydraulic engineering. In these capacities, he laid out irrigation systems on several sugar plantations in the still-independent Kingdom of Hawaii.[54] The organizers of the California Midwinter International Exposition hired O'Shaughnessy to serve as its Chief Engineer in 1893. In 1895, O'Shaughnessy put his hydraulic engineering skills to use as an employee of the Spring Valley Water Company, the privately owned predecessor to the San Francisco Water Department.

During the late 1890s and first few years of the twentieth century, O'Shaughnessy consulted on many different projects for private companies and municipalities, including the City and County of San Francisco. O'Shaughnessy laid out Sloat Boulevard and the old Bayshore Highway for the City's Public Works Department but he took no other consulting projects for San Francisco because he did not enjoy the city's fractious political environment. In 1907, the Southern California Mountain Water Company hired O'Shaughnessy to be its Chief Engineer, where he worked on water delivery systems for several communities in San Diego County. In 1912, after much hard bargaining, Mayor Rolph convinced O'Shaughnessy to come back to San Francisco to accept the appointment of Chief Engineer for the City and County of San Francisco.[55]

[53] Charles R. Boden, "In Memoriam: Michael Maurice O'Shaughnessy," *California Historical Quarterly,* Vol. 13, No. 4, California Historical Society.
[54] Wanda Adams, "Hike through History at Pololu Valley," *Honolulu Advertiser* (September 8, 2002).
[55] Michael M. O'Shaughnessy, *Hetch Hetchy: Its Origin and History* (San Francisco: 1934), 10.

When O'Shaughnessy was hired, San Francisco had just embarked upon a pair of major infrastructure projects: the Municipal Railway and the Hetch Hetchy water delivery system. O'Shaughnessy's vision for the new Municipal Railway centered on it becoming an extensive citywide system that would provide service to sparsely populated areas well in advance of residential construction to ensure orderly growth. Though he used bond funds when they were available, O'Shaughnessy was dedicated to the financial health of the city, using operating income and local property tax assessments as much as possible to finance its expansion.[56] In addition to engineering railway alignments, O'Shaughnessy's office was responsible for most associated infrastructure, including tunnels, retaining walls, car barns, power houses, and office buildings. Although he was an engineer, O'Shaughnessy believed that his work should enhance the beauty of the city and even his lowliest retaining wall includes a modicum of architectural detailing. Stylistically speaking, most of the work designed by O'Shaughnessy's office adhered to a chaste Renaissance Revival vocabulary that was popular during the post-1906 reconstruction era. He employed this style on dozens of projects, including the Stockton Street Tunnel, Laguna Honda (now Forest Hill) Station, and Twin Peaks Tunnel's west portal **(Figure 86)**. Common features of his work include board-formed concrete surfaces rusticated to resemble masonry, simple Tuscan pilasters, and modillion cornices.

Figure 86. West Portal of Twin Peaks Tunnel, 1919.
Source: SFMTA Photography Department and Archive, Image No. W05679

M. M. O'Shaughnessy was hired just one year before Congress passed the Raker Act in 1913. This act, which authorized the construction of several dams, a railroad, and other infrastructure in Yosemite National Park, provided San Francisco with the legal basis to begin building its Hetch Hetchy water delivery system. This $100 million project occupied the majority of O'Shaughnessy's attention for the rest of his career, with water first flowing from the Tuolumne River into San Francisco in 1934, 20 years after construction began. Unfortunately for O'Shaughnessy, he did not live to see the completion of the Hetch Hetchy project, as he died in 1933 after suffering a heart attack. Today, O'Shaughnessy's name lives on in the name of the Hetch Hetchy's highest dam, as well as O'Shaughnessy Boulevard.

[56] Robert Cherny, "City Commercial, City Beautiful, City Practical: The San Francisco Visions of William C. Ralston, James D. Phelan, and Michael M. O'Shaughnessy," *California History* (Fall 1994).

I. Design of American Car Barns and Bus Yards

Car barns have been an essential part of street rail operations in American cities since the late nineteenth century. Designed to service and store off-duty streetcars, the earliest car barns were built alongside the large stables that had housed the original traction method for most American street railways. Early car barns were either modeled on these stables or on the brick shops used in conventional rail yards. Car barns were always built adjacent to or near a streetcar line, sometimes at the end of the line, but also often near the midpoint so that it was easily accessible from either end. Car barns typically included a series of maintenance bays on one floor level to facilitate access from adjoining street-level tracks. In addition to maintenance and storage functions, car barns often also had offices and power generation facilities. Although the offices were usually located on the second story, for safety reasons, the powerhouse was usually a separate structure.

Following the lead of conventional railroads, builders of early street railways often designed their car barns in the American Commercial style and built them of brick. Examples of this type in San Francisco include the SFMTA Cable Car Barn and Powerhouse at Washington and Mason Streets in Chinatown **(Figure 87)**. Originally built in 1887 by the Ferries & Cliff House Railway, the SFMTA Cable Car Barn was badly damaged in the 1906 Earthquake and subsequently rebuilt without its third floor level. Wood was not unheard of for car barn construction, especially for smaller transit providers or for temporary facilities. Nonetheless, masonry remained the most popular building material because it was resistant to fire and could be manipulated to provide large semi-continuous spans for multiple vehicular entrances.

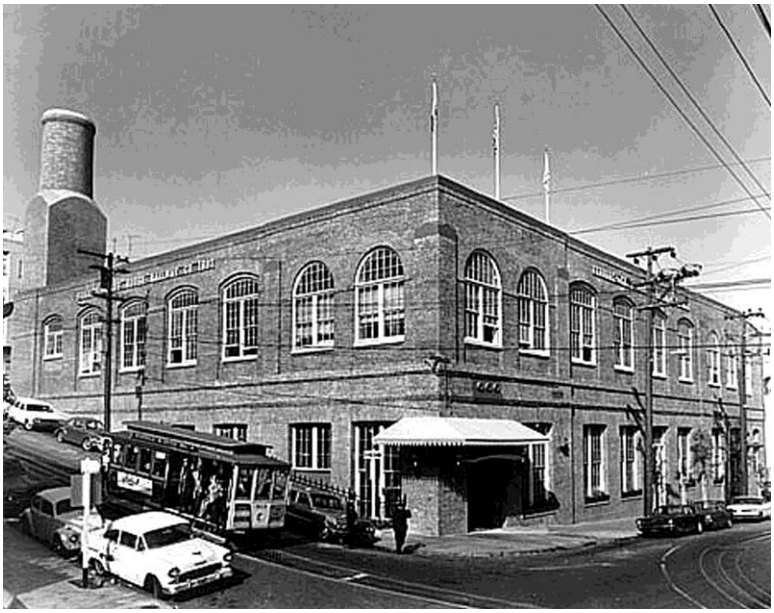


Figure 87. SFMTA Cable Car Barn and Powerhouse, ca. 1960, Mason and Washington Streets, built 1887; rebuilt 1906.
Source: San Francisco Historical Photograph Collection, San Francisco Public Library, Image No. AAC-8149

Concrete construction for car barns surged in popularity in San Francisco after the 1906 Earthquake and Fire. The disaster had destroyed and/or heavily damaged several car barns throughout the city, including the San Francisco & San Mateo Electric Railway Co. Car Barn at San Jose and Geneva Avenues. Built in 1901, the building, which is now known as the Geneva Car Barn, was originally part of a larger complex that consisted of a car barn, a powerhouse, and an office building. Though it is mistakenly called a car barn, the building that stands today is actually the office building **(Figure 88)**. Designed in the American Commercial style with Renaissance Revival and Craftsman detailing, the Geneva Car Barn is incidentally one of the only buildings in San Francisco to retain visible damage from the 1906 Earthquake.

Figure 88. Geneva Car Barn and Powerhouse at San Jose and Geneva Avenues, ca. 1905; built 1901 and repaired 1906.
Source: www.genevacarbarn.org

The organization of the San Francisco Municipal Railway in 1911-12 launched a new approach to car barn design in San Francisco. As described above, Muni had to move quickly in order to establish a system capable of taking on the United Railroads of San Francisco and other private providers. Due to San Francisco's unique street pattern, with Market Street essentially dividing the city into two separate sections, Muni decided to build two new car barns – one in each part of the city. The Geary Car Barn was built first to serve Muni's north of Market Street lines. Constructed in 1912, the complex consisted of an eight-bay maintenance and storage facility along Geary Street, a corner office building, and a carpenter shop and machine shop along Presidio Avenue **(Figure 89)**. The expansion of service south of Market Street compelled Muni to build a second car barn in the Potrero District in 1914-15. Initially built to serve Muni's H Potrero and J Church streetcar lines, the Potrero Car Barn was designed as a two-story building but only the first floor level – the section containing the maintenance shops – was built first. The office wing housing operations and two additional streetcar maintenance shops were completed a little over a decade later in 1925. In terms of their construction methods, materials, and styling, the Geary and Potrero Car Barns were very similar, having both been designed by the Office of the City Engineer, Michael M. O'Shaughnessy.

Figure 89. Geary Street Car Barn at Geary Boulevard and Presidio Avenue, 1968; built 1912.
Source: SFMTA Photography Department and Archive, Image No. M0324_2

In addition to the two car barns it built in the 1910s, Muni acquired many others after purchasing competing companies, especially in 1944 when Muni absorbed the Market Street Railway. After 1944, the oldest car barns in the Muni system were the Haight Street and the McAllister Street Car Houses. They were both built in 1883 by the Market Street Railway. Muni demolished them both in the late 1940s and sold the sites for development. The next-oldest car barn was the Oak and Broderick Car House, which was built by the Market Street Railway in 1889. Muni demolished it in 1949 and sold the site for development. The fourth-oldest facility was the Turk and Fillmore Car House and Powerhouse, which the Market Street Railway built in 1895. Muni cleared the site except for the electrical substation, which it continued to use for many years. The Turk Street Substation is San Francisco City Landmark 105 **(Figure 90)**. The fifth-oldest car barn was the Sutro Car House, which the Sutro Railway built in 1896. Muni acquired this company and demolished the car barn in 1951. The sixth-oldest car barn owned by Muni in 1944 was the 24th and Utah Car House. Unlike the rest, Muni retained this facility, which was built in 1903-04 by the URR, and converted it into a bus garage. It was not demolished until the 1990s. Muni also retained the 29th and Mission Car House, which was built in 1894 by the Market Street Railway. Muni repurposed it for a number of uses before tearing it down in 1987. The largest and most important car barn acquired by Muni in 1944 was the Elkton Shops complex, which was built in 1907 by the URR at Ocean and Geneva Avenues. In 1949, Muni converted a portion of the yard into the Ocean Division Bus Yard. Muni cleared the site in 1977 to build the Muni Metro Center LRV facility (now the Curtis E. Green Light Rail Center). Though not built as a car barn, another URR facility acquired by Muni in 1944 was the Market Street Railway Steam Power Plant at 1401 Bryant Street **(Figure 91)**. Built in 1893 and enlarged in 1895, the URR converted the building into a substation in 1911. After 1944, Muni continued to use the building as a substation, later converting it into a warehouse. Today, the SFMTA uses it to store overhead line equipment. It is listed in the California Register as a contributor to the Showplace Square Heavy Timber and Steel-frame Brick Warehouse and Factory Historic District.

Figure 90. Turk and Fillmore Substation, 1966; built 1895.
Source: SFMTA Photography Department and Archive, Image No. X9762_1

Figure 91. Market Street Railway Powerhouse, 1904; built 1893.
Source: SFMTA Photography Department and Archive, Image No. U00137

As described in the chapters above, Muni's acquisition of the Market Street Railway in 1944 created a whole host of problems for the already beleaguered transportation provider. These issues compounded pre-existing challenges that had begun to emerge before World War II, chiefly the growing use of private automobiles, the high expense of building streetcar tunnels and extensions, and the requirement that two workers staff streetcars: a motorman and a ticket taker. Faced with the need to eliminate duplicative service and reduce costs, the PUC hired several consultants to advise them on how to reconfigure Muni service after the war. As mentioned previously, the Lapham Plan and the 1947 Muni bond spearheaded these proposed changes to Muni's operations, including the replacement of most of the system's streetcar lines with bus and trolley coach service. After voters approved the bond, the PUC launched a major multi-year campaign to put the recommendations into place, eliminating all but a handful of streetcar lines and replacing the rest with buses and trolley coaches. The changes led to a tremendous demand for more bus storage and maintenance facilities across the city. Muni converted its two purpose-built streetcar barns, the Potrero and Geary Car Barns, to accommodate electric-powered trolley coaches in 1948-49. At the same time, Muni built two new bus yards to store and service its growing fleet of gasoline-powered (and later diesel) motor coaches, including the Ocean Division Bus Yard, which was built at Ocean and San Jose Avenues in 1948-49; and the Kirkland Bus Yard, which was built in 1950 at Stockton and North Point Streets. The Ocean Division yard was demolished in 1977, making Kirkland Muni's oldest motor coach facility.

Since 1950, Muni has built three additional motor coach facilities at various locations in the city. One (Flynn) was inserted into an existing industrial building, the 1941 U.S. Steel Corporation warehouse, at 16th and Folsom Streets. The other two, Woods and Islais Creek, were all-new facilities. In addition, both are, like Kirkland, asphalt-paved lots used for parking and storage, with small freestanding buildings for heavy and running repair, tire changing, fuel dispensing, and washing. Woods Motor Coach Division is the oldest and by far the largest and most comprehensive in terms of the services it offers **(Figure 92)**. Built in 1974-76 at 1095 Indiana Street, the Woods Division is 8.2 acres in area. It includes bus parking and storage, the central heavy repair shops for the entire fleet, body and paint shops, fuel dispensing, and washing. It has a separate building at 22nd and Indiana Streets for its Operations Department. Located less than a half-mile away is the Islais Creek Motor Coach Facility at 1301 Cesar Chavez Street. Built in 2012, Islais Creek includes motor coach storage, light running repair, fuel dispensing, and bus washing. It will soon receive a new building for the Operations Department.

Figure 92. Woods Motor Coach Division, 1975. Source: SFMTA Photography Department & Archive, Image No. M2093_3

The SFMTA, which operates Muni, also operates two modern streetcar facilities, including the Curtis E. Green Light Rail Center, a sprawling complex of shops located next to the Balboa Park BART station at the northwest corner of Geneva and Ocean Avenues. Built in 1977 as the Muni Metro Center LRV facility, this project consolidated Muni's light rail storage and maintenance facilities in one location **(Figure 93)**. In recent years, Muni opened the Muni Metro East yard at 25th and Illinois Streets to serve its T Third line and any future expansions of the system along the Central and Southeastern waterfront areas **(Figure 94)**.

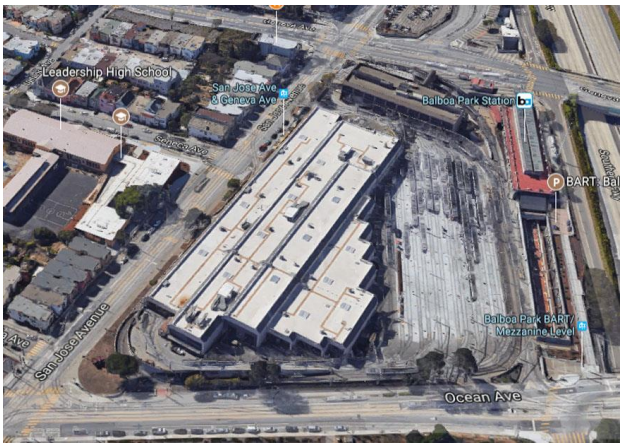


Figure 93. Curtis E. Green Light Rail Center; view toward south.

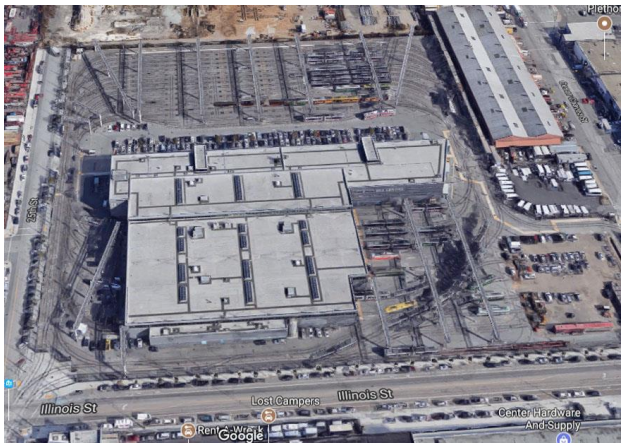


Figure 94. Muni Metro East Light Rail Center; view toward east.

VI. Determination of Eligibility

VerPlanck Historic Preservation Consulting evaluated the potential eligibility of the Potrero Trolley Coach Division maintenance/operations facility for the California Register of Historical Resources (California Register).

A. California Register of Historical Resources

The California Register is an authoritative guide to significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register–eligible properties (both listed and formal determinations of eligibility) are automatically listed. The California Register also includes properties identified in historical resource surveys with Status Codes from 1 to 5 and resources designated as local landmarks in city or county ordinances. Properties can be nominated to the California Register by local governments, organizations, or private citizens. The eligibility criteria used by the California Register are closely based on those developed by the National Park Service for the National Register of Historic Places (National Register). In order to be eligible for listing in the California Register a property must be demonstrated to be significant under one or more of the following criteria:

> **Criterion 1 (Event):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
>
> **Criterion 2 (Person):** Resources that are associated with the lives of persons important to local, California, or national history.
>
> **Criterion 3 (Design/Construction):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.
>
> **Criterion 4 (Information Potential):** Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California or the nation.

In addition to meeting at least one of the criteria a property must retain historical integrity, meaning that it must look much the same as it did when it achieved significance, which in most cases is when it was originally built.

Criterion 1 (Event)

The Potrero Trolley Coach Division maintenance/operations facility appears eligible for listing in the California Register under Criterion 1 (Events) as a facility dating back to the earliest years of San Francisco's Municipal Railway, the United States' first publicly owned street railway. Throughout the nineteenth century, San Francisco had been dominated by *laissez faire* Republicans who did not view civic infrastructure as a priority. The election of James Phelan, an Irish-American Democrat, as mayor in 1897 led to a significant political realignment in San Francisco, culminating with the adoption of a reformist City Charter in 1900. In a stunning break from the past, the 1900 Charter called for the acquisition of utilities to ensure the provision of public services on a more efficient and equitable basis, including "water-works," "gas-works," and "railroads." Founded in 1906 and up and running in 1912, San Francisco's Municipal Railway was a bold experiment in public ownership of a sector that had previously been characterized by high fares and inefficient service. These private companies were organized to make money and not to provide

a public service. Municipal ownership, it was hoped, would rationalize the tangled web of competing lines and distribute transit lines more equitably throughout the city, including to outlying areas to ensure orderly development.

Under the direction of Superintendent Bion J. Arnold and City Engineer Michael M. O'Shaughnessy, the San Francisco Municipal Railway opened in 1911-12 with the Geary Street trunk line running from the Ferry Building to the Pacific Ocean. Working to ensure that Muni could compete with the URR and other private street railroads, Arnold and O'Shaughnessy expanded Muni's service range as quickly as possible, including to the upcoming Panama Pacific International Exposition, as well as to the perennially underserved working-class neighborhoods south of Market Street, including the Mission and Potrero Districts. Challenges were many, including the city's steep topography, acquiring and building rights-of-way across competing lines, and building the supporting infrastructure needed to run a major street railway. The Potrero Car Barn, as the facility was first known, was Muni's second purpose-built car barn and the first such facility built south of Market Street. Built in two sections, with the maintenance shops finished first in 1915 and the second-floor office and shops wings in 1924, the Potrero Car Barn resembled the slightly earlier Geary Car Barn, which Muni had built in 1911-12 to serve its north of Market Street lines. The Potrero and Geary Car Barns remained the only car barns built by the City and County of San Francisco until 1977, when it built the Muni Metro Center LRV facility.

The period of significance for the Potrero Trolley Coach Division maintenance/operations facility under Criterion 1 is 1915 to 1948.

Criterion 2 (Person)
The Potrero Trolley Coach Division maintenance/operations facility does not appear eligible for listing in the California Register under Criterion 2 because it is not associated with the lives of any persons significant in our past.

Criterion 3 (Design/Construction)
The Potrero Trolley Coach Division maintenance/operations facility appears eligible for listing in the California Register under Criterion 3 as a property that embodies the characteristics of a type (car barn), period of construction (post-quake reconstruction), as well as being the work of a master (Michael M. O'Shaughnessy). The car barn is a property type that emerged in the late nineteenth century to store and maintain streetcars. Descended functionally from stables and conventional railroad shops, most early American car barns were built either of wood or brick. In San Francisco, as in the rest of the country, most early car barns were built of brick and designed in the American Commercial style. When Muni opened in 1911-12, it built two new car barns to provide maintenance and storage services for its lines on either side of Market Street. These two buildings, the Geary and Potrero Car Barns, were different from their predecessors in that they were built of reinforced concrete and designed in the Renaissance Revival style. Today, there are very few pre-World War II car barns left in San Francisco. Although parts of larger multi-building facilities survive, including the Geneva Car Barn (office building only) and the Turk and Fillmore Car Barn (substation only), the only pre-war car barns that survive include the SFMTA Cable Car Barn (built 1887; rebuilt 1906), the Geary Car Barn (now the Presidio Trolley Coach Division – built 1911-12), and the Potrero Car Barn (now the Potrero Trolley Coach Division – built 1915 and 1924).

The Potrero Trolley Coach Division maintenance/operations facility also appears eligible under Criterion 3 as a work of City Engineer Michael M. O'Shaughnessy, the most influential and important Chief Engineer to ever hold this position in San Francisco. Although a functional structure whose main purposes were streetcar maintenance and storage, O'Shaughnessy gave the building a Renaissance Revival exterior so that it would be an attractive addition to its neighborhood. Nearly all of O'Shaughnessy's public works were designed using the same stylistic vocabulary. No structure was too humble, ranging from simple retailing walls lining road cuts, to tunnels, to transit stations and other infrastructure.

The period of significance for the Potrero Trolley Coach Division maintenance/operations facility under Criterion 3 is 1924 to 1941.

Criterion 4 (Information Potential)
Evaluation of the Potrero Trolley Coach Division maintenance/operations facility for California Register eligibility under Criterion 4 is beyond the scope of this report because this criterion is concerned primarily with archaeological resources. It is worth noting, however, that the construction of the Potrero Car Barn in 1915 and the adjoining bus yard in 1948-49 resulted in substantial subsurface excavation and grading that would have likely removed any building foundations or other historic-era artifacts. Nonetheless, the services of a qualified archaeologist are necessary to rule out the possibility of encountering any historic or prehistoric-era resources.

B. Integrity

The Potrero Trolley Coach Division maintenance/operations facility has undergone several alterations since it was completed in 1924. Described in more depth in the pages above, the most substantial changes occurred in 1948-49 when Muni converted the building from a car barn into a trolley coach facility. In addition to reconfiguring the interior, the project resulted in the removal of the rear portion of two streetcar maintenance shops on the second floor level, remodeling the west façade, construction of a wall and a control room at 17th and Hampshire Streets, altering several vehicular bays on Mariposa Street, and removing all tracks from the site. In 1989-90, Muni completed a multi-million-dollar seismic retrofit and remodel of the facility, resulting in additional changes to the interior, the west façade, and the main entrance on Mariposa Street. Despite these alterations, the building is still recognizable as an early twentieth century car barn, in particular from the corner of Mariposa and Hampshire Streets. Although the type of vehicles the building serviced changed in 1949, the essential function of the building as a maintenance and operations facility for a major municipal transit agency have not changed. The most extensive alterations occurred along the tertiary and quaternary façades, most of which are obscured behind walls, fencing, equipment, and street trees. In contrast, the two primary street façades are still largely intact from the period of significance. The interior, though it has also been altered over time, still feels like an early twentieth century transit facility. In conclusion, the Potrero Trolley Coach Division maintenance/operations facility retains the aspects of location, design, materials, workmanship, feeling, and association. It does not retain the aspect of setting because the adjoining site has undergone too many changes.

C. Character-defining Features

The character-defining features of the Potrero Trolley Coach Division maintenance/operations facility include all features present during the period of significance of 1915 to 1948, before the facility was converted into a bus yard and trolley coach maintenance facility. The following character-defining features are for the most part confined to the two-story office wing and a section of the shops wing along Hampshire Street:

- Overall height and massing of the two-story office wing and the remaining portions of the original shops wing along Hampshire Street, including its flat roof;
- Fenestration pattern on office wing (Mariposa and Hampshire Streets only) consisting of large vehicular openings at the first floor and groups of three double-hung metal windows at the second floor level;
- Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire Streets, including re-entrant corner detailing, pilasters separating the vehicular openings, molded intermediate cornice, continuous lug sill beneath the windows, shallow cornice, and medallion featuring original Muni logo. Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street;
- Remaining pedestrian door surround on Hampshire Street façade with inscription above;
- Remaining door trim on westernmost vehicular bay on Mariposa Street;
- Surviving double-hung, six-over-six, metal windows on office wing;
- Flagpole.

D. Potential Historic District

As mentioned above, the Potrero Trolley Coach Division maintenance/operations facility was evaluated in the 2009 Showplace Square Survey. The Showplace Square survey also inventoried the surrounding neighborhood – surveying individual buildings as well as identifying any potential historic districts. Although the survey identified several dozen properties that appeared eligible for individual listing in the California Register, only one historic district was identified: the Heavy Timber and Steel-frame Brick Warehouse and Factory District. This discontiguous district consists of 10 large brick factories and warehouses grouped in three separate clusters. The Potrero Trolley Coach Division maintenance/operations facility is not located inside the boundaries of this California Register-listed historic district and as a concrete transit facility it does not share the same function, material, or architectural vocabulary, which would preclude its addition to this district. Furthermore, its neighbors span a wide range of construction dates, encompass many different building types and architectural styles, making the surrounding neighborhood too incohesive to be its own historic district.

VII. Conclusion

The Potrero Trolley Coach Division maintenance/operations facility was designed by the Office of the City Engineer Michael M. O'Shaughnessy and built in two phases, beginning with the one-story car barn section in 1915, and concluding with the second-floor office wing and two maintenance shops in 1924. The facility was Muni's second purpose-built streetcar barn and the first such facility constructed south of Market Street. It was built to provide maintenance and storage facilities for Muni's streetcar lines operating south of Market Street. Falling ridership in the 1930s, combined with the rising expenses associated with streetcar operations, convinced the PUC to examine the efficacy of its streetcar service. Following the recommendations of several reports after World War II, including a study by former General Motors executive Colonel Marmion D. Mills, the PUC decided to replace nearly all of its streetcar lines with bus or trolley coach service. As part of this effort, the Potrero Car Barn was converted into a trolley coach maintenance and operations facility. A new bus yard was also built on the adjoining block to the west and York Street abandoned to create a large "superblock." Ever since 1949, the property has served as one of Muni's two trolley coach facilities – the other being the Presidio Division – and the only one south of Market Street. The former Potrero Car Barn appears eligible for listing in the California Register under Criterion 1 (Events) as a facility associated with the establishment of Muni in 1911-12 and its earliest operations south of Market Street. It also appears eligible for listing under Criterion 3 (Design/Construction) as a moderately intact streetcar barn designed by City Engineer Michael M. O'Shaughnessy. Although it was converted into a trolley coach facility in 1948-49, the building is still recognizable as an early twentieth century car barn designed in the Renaissance Revival style.

VIII. Bibliography

A. Published and Unpublished Books, Articles, and Reports

Bancroft, Hubert H. *History of California, Volume VI.* San Francisco: The History Company, 1886–1890.

Byington, Lewis F. *History of San Francisco.* Chicago: S.J. Clarke Publishing Co., 1931.

California Office of Historic Preservation. *California Historical Resource Status Codes.* Sacramento: 2003.

Davis, Ellis A. *Davis' New Commercial Encyclopedia.* San Francisco: 1914.

Gebhard, David, Robert Winter, et al. *The Guide to Architecture in San Francisco and Northern California.* Salt Lake City: Peregrine-Smith Books, 1985 Ed.

Hicks-Judd Company. *The San Francisco Block Book.* San Francisco: 1894, 1901, 1909.

Hunt, Rockwell D. *California and Californians.* Chicago: Lewis Publishing Company, 1932.

Junior League of San Francisco. *Here Today: San Francisco's Architectural Heritage.* San Francisco: Chronicle Books, 1968.

Kelley and VerPlanck Historical Resources Consulting. *Showplace Square Historic Context Statement.* San Francisco: Prepared for the San Francisco Redevelopment Agency, 2009.

Moudon, Anne Vernez. *Built for Change: Neighborhood Architecture in San Francisco.* Cambridge, MA: The MIT Press, 1986.

O'Shaughnessy, Michael M. *Hetch Hetchy: Its Origin and History.* San Francisco: 1934.

Olmsted, Roger and T. H. Watkins. *Here Today: San Francisco's Architectural Heritage*. San Francisco: Junior League of San Francisco Inc., 1968.

Perles, Anthony. *The People's Railway.* Glendale, CA: Interurban Press, 1981.

Sanborn Fire Insurance Company: Sanborn Maps for San Francisco: 1893, 1899, 1915, and 1950.

San Francisco City Directories: 1906–1982.

San Francisco Planning Department. *CEQA Review Procedures for Historical Resources*. San Francisco: 2005.

San Francisco Planning Department. *San Francisco Preservation Bulletin No. 9: Landmarks.* San Francisco: 2003.

San Francisco Planning Department. *San Francisco Preservation Bulletin No. 11: Historic Resource Surveys.* San Francisco: n.d.

Scott, Mel. *The San Francisco Bay Area: A Metropolis in Perspective.* Berkeley: University of California Press, 1959.

Shepherd, Susan. *In the Neighborhoods: A Guide to the Joys and Discoveries of San Francisco's Neighborhoods.* San Francisco: Chronicle Books, 1981.

U.S. Department of the Interior, National Park Service. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation.* Washington, D.C.: rev. ed. 1998.

U.S. Department of the Interior, National Park Service. *National Register Bulletin 16: "How to Apply the National Register Criteria for Evaluation."* Washington, D.C.: rev. ed. 1998.

U.S. Department of the Interior, National Park Service. *Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings.* Washington, D.C.: *1997*.

Whiffen, Marcus. *American Architecture since 1870.* Cambridge, MA: The M.I.T. Press, 1969.

Wiley, Peter Booth. *National Trust Guide to San Francisco.* New York: John Wiley & Sons, 2000.

B. Newspapers and Periodicals

Adams, Wanda. "Hike through History at Pololu Valley." *Honolulu Advertiser* (September 8, 2002).

Boden, Charles R. "In Memoriam: Michael Maurice O'Shaughnessy." *California Historical Quarterly,* Vol. 13, No. 4.

Building & Engineering News (June 20, 1915).

Caen, Herb. "Ready When You Are." *San Francisco Chronicle* (December 16, 1980), 33.

"California Street Municipal Railway and another Car Barn to be Built." *San Francisco Chronicle* (December 3, 1914), 5.

Cherny, Robert. "City Commercial, City Beautiful, City Practical: The San Francisco Visions of William C. Ralston, James D. Phelan, and Michael M. O'Shaughnessy." *California History* (Fall 1994).

"Contracts Given by Works Board." *San Francisco Chronicle* (July 14, 1914), 5.

"Estimates Cost of New City Railway Lines." *San Francisco Chronicle* (December 14, 1913), 21.

Kamin, Ira. "Night Watch on the Muni." *San Francisco Chronicle* (August 7, 1977), 234.

Leavitt, Ray. "53 Trolley Buses Arrive….Below Par." *San Francisco Chronicle* (April 7, 1949), 2.

"Little More than Week Left to Register for Coming Election." *San Francisco Chronicle* (July 16, 1913), 11.

"Mission Asks for More Railroads." *San Francisco Chronicle* (March 5, 1913), 9.

"Municipal Car Barn Contract Completed." *San Francisco Chronicle* (May 9, 1915).

"New Muni Changes Coming: One July 3 City will Drop Six Car Lines…Start Five Bus, Five Trolley Coach Lines." *San Francisco Chronicle* (April 7, 1949), 2.

"New Muni Manager: Charles D. Miller to Assume Part of Scott's Duties." *San Francisco Chronicle* (January 3, 1951), 1.

"Pioneer Muni Employee will Retire Today." *San Francisco Chronicle* (November 30, 1948), 17.

"Planning for New City Car Lines." *San Francisco Chronicle* (October 1, 1913), 5.

"Property Owners to Pay for City Railway Paving." *San Francisco Chronicle* (January 23, 1914), 16.

"Quick Track Work Promised by City." *San Francisco Chronicle* (September 4, 1913), 13.

C. Public Records

California Death Index: 1940–1997.

California Marriage Index, 1960–1985.

California Passenger and Crew Lists, 1882–1957.

CEQA Guidelines subsection 15064.5(b).

Edwards Abstracts. San Francisco Public Library.

Great Register of Voters. San Francisco Public Library.

San Francisco Office of the Assessor-Recorder: Sales Ledgers and deeds for 2500 Mariposa Street.

San Francisco Bureau of Building Inspection, Records Management Division: Building and alteration permits on file for 2500 Mariposa Street.

U.S. Bureau of the Census. Records for City and County of San Francisco, 1870–1940.

D. Websites

Carlsson, Chris. "United Railroads." FoundSF: http://www.foundsf.org/index.php?title=United_Railroads, accessed July 5, 2017.

"Our History." Market Street Railway: https://www.streetcar.org/about-sfmsr/our-history/, accessed July 5, 2017.

IX. Appendix

A. DPR 523 Forms for APN 3971/001
B. Construction and Alteration Permits APN 3971/001

State of California The Resources Agency
Department of Parks and Recreation
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 3CB
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 4 *Resource name(s) or number (assigned by recorder) 2501 -2691 17TH ST
P1. Other Identifier San Francisco Municipal Railway Potrero Car Barn
*P2. Location: ☐ Not for Publication ☒ Unrestricted
*a. County: San Francisco and P2b and P2c or P2d. Attach a Location Map as necessary.
*b. USGS 7.5' Quad: SF North Date: 1994
*c. Address: 2501 -2691 17th St City: San Francisco Zip: 94110
d. UTM: (Give more than one ofr large and/or linear resources) Zone ____; _____mE/ _____ mN
e. Other Locational Data: Assessor's Parcel Number: 3971001

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

2501 17th Street occupies a portion of a 191,999 square-foot block bounded by 17th, Hampshire, Mariposa, and Bryant streets. Owned by San Francisco's Municipal Railway (MUNI), the property is primarily utilized as surface storage for MUNI's Potrero Division's fleet of trackless trolleys. Located at the southeast corner of the property is at two-story concrete, L-plan structure utilized as shops and garage space. The building, partially finished in stucco, rests on a concrete perimeter foundation and it is capped by a flat roof with skylights. The primary facade, which is set back from Mariposa Street, is seven bays wide. The secondary facade, which is three bays wide and built to the lot line, faces east toward Hampshire Street. The leftmost bay of the primary facade features a one-story addition built out to the south lot line. This addition is distinguished by ribbon fenestration beneath an oversized, boxed soffit. It obscures the building's original main entrance, which can still be distinguished by an entablature with oversized dentils and a frieze of carved lettering reading, "Municipal Railway AD 1915." The main entrance is now located in the next bay to the right, which contains a vehicular opening and a modern pedestrian entrance with multi-light sidelights and transom. Vehicular openings characterize the remaining bays, each with enough space to accommodate two city buses. Molded pilasters divide each bay at the first floor level. A belt course divides the first and second floors. Every bay of the second floor level is articulated by three six-over-six, double-hung, wood-sash windows.

The leftmost bay of the first floor level on the secondary facade features the building's secondary pedestrian

*P3b. Resource Attributes: (list attributes and codes) HP8. Industrial Building, HP17. Railroad Depot
P4. Resources Present: ◉ Building ○ Structure ○ Object ○ Site ○ District ◉ Element of District ○ Other (Isolates, etc.)
P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects

*P5b. Photo (view, date, accession #
100_5701.JPG, 11/20/2007, view to NE

*P6. Date Constructed/Age and Sources
☒ Historic ☐ Prehistoric ☐ Both
After 1913, Sanborn Maps

*P7. Owner and Address:
City Property
Accounting
850 Bryant St.
San Francisco Ca 94103

*P8. Recorded by
Tim Kelley
Tim Kelley Consulting
2912 Diamond St. #330

*P9. Date Recorded:
6/12/08

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none") San Francisco Office of the Assessor/Recorder

*Attachments
☒ BSOR ☐ None ☒ Continuation Sheet
☐ Archaeological Record ☐ District Record ☐ Location Map ☐ Other...
☐ Artifact Record ☐ Photograph Record ☐ Linear Feature Record

State of California The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

NRHP Status Code 3CB

 ***Resource Name of # (Assigned by recorder)** 2501 -2691 17TH ST

B1. Historic Name: 17th Street Carhouse, Potrero Carhouse
B2. Common Name Municipal Railway Car Barn
B3. Original Use Car barn, maintenance facility for B4. Present Use Storage and maintenance
*B5. Architectural Style Utilitarian with Classical Revival detailing
***B6. Construction History (Construction Date, alterations and date of alterations)**
2501-2691 17th Street was constructed in 1915, and expanded in 1924 and 1941.

***B7. Moved?** ☒ **No** ☐ **Yes** **Date** **Original Location:**
***B8. Related Features:**

B9a. Architect M.M. O'Shaugnessy **b. Builder** Clinton Fireproofing Company
***B10 Significance: Theme** Transportation Infrastructure **Area** Showplace Square Survey Area

Period of Significance 1915-1941 **Property Type** Car barn and **Applicable Criteria** 1 & 3
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

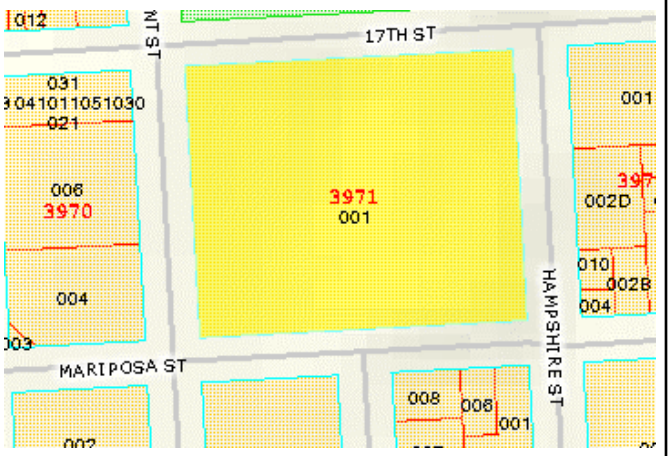
On September 7, 1914, the newly founded Municipal Railway (MUNI) completed its first line south of Market Street, the southern leg of its H-Potrero line, which ran from 11th and Market streets to 25th Street and Potrero Avenue. In anticipation of more lines in the area, MUNI constructed a car barn and maintenance shop at 17th and Hampshire streets, one block west of Potrero Avenue. The car barn, which was built to house and repair street cars, is virtually identical to MUNI's first car barn, built in 1912 at Geary Boulevard and Presidio Avenue. Designed by the office of San Francisco City Engineer Michael M. O'Shaugnessy as a two-story building, the building was originally only one-story in height. In 1924, the second-floor offices were added atop the garage bays, completing the original design. In 1941, MUNI completed a two-story addition along Hampshire Street to house the cars of the new R line. By 1947, the new parking lot to the west of the building was built to house electric buses and coaches. The facility continues to be used for storing and servicing a portion of MUNI's electric trolley bus fleet.

2501-2691 17th Street appears eligible for listing in the California Register under Criterion 1 (Events) for its association with the early days of the San Francisco Municipal Railway, and in particular with the initial expansion of MUNI service south of Market Street. The building appears eligible under Criterion 3 (Design/Construction) as an example of a type (municipal car barn), period (World War I era), and method of construction (reinforced concrete). (continued)

B11. Additional Resource Attributes (List attributes and codes) HP8. Industrial Building, HP17. Railroad Depot
B12. References Assessor's Records
McKane, John and Anthony Perles, *Inside Muni*, (Glendale: Interurban Press, 1982), 128-132.
Sanborn Maps 1900, 1914, 1950 (continued)

B13. Remarks

(Sketch Map with north arrow required.)



B14. Evaluator Christopher VerPlanck

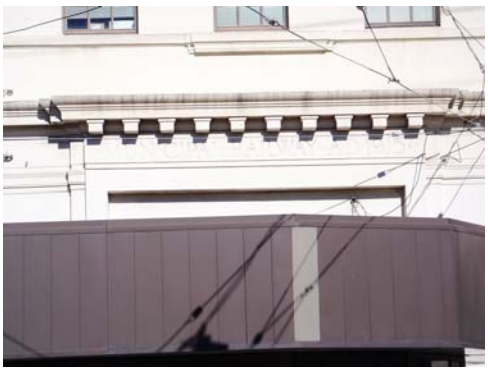
*Date of Evaluation 12.11.08

(This space reserved for official comments)

B10 Significance (continued)
The building is also a work of a master, designed by the office of San Francisco's greatest city engineer, Michael Maurice O'Shaughnessy, mastermind of much of the City's important civic infrastructure during the first quarter of the twentieth century. Aside from the addition of a one-story structure on the primary facade, the building has undergone few exterior alterations since the end of the period of significance. The building retains the following aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.

B12 References (continued)
San Francisco Chronicle, "City to Buy Lands for Municipal Railway Uses," January 17, 1914
San Francisco Chronicle, "Municipal Car Barn Contract Completed," May 9, 1915

100_5706.JPG, 11/20/2007, view to SW



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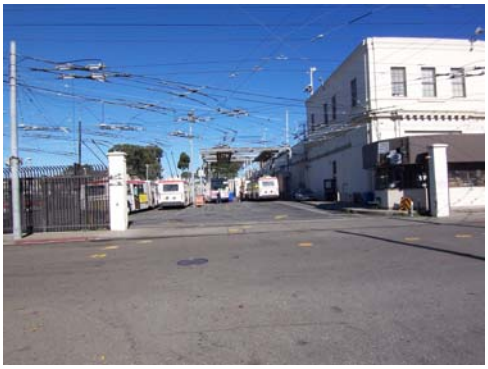

100_5702.JPG, 11/20/2007, view to N

100_5698.JPG, 11/20/2007, view to E, yard

100_5696.JPG, 11/20/2007, view to E

100_5687.JPG, 11/20/2007, view to W, Hampshire St. elevation

OFFICIAL COPY

FOR DEPARTMENTAL USE ONLY

APR 2 5 1979

APPROVED FOR ISSUANCE

Received by Corr 4/23/79

FILMED

WCAK7-1-79 2351

DATE FILED 3-5-79

FILING FEE RECEIPT NO. 338

PERMIT NO. 447827

ISSUED 4/30/79

CITY AND COUNTY OF SAN FRANCISCO

DEPARTMENT OF PUBLIC WORKS

2500 MARIPOSA ST

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

BLDG. FORM 3

OFFICE COPY

APPLICATION NO. 7902044

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF PUBLIC WORKS OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH:

(1) STREET ADDRESS OF JOB: 17th & Potrero St 17th
Potrero Car House Paint Shop Wash. Room Mariposa & Bryant

(3) ESTIMATED COST OF JOB: $19,527.00

DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR. 1-hr N 1 2 3 4 5 — (5A) NUMBER OF STORIES OF OCCUPANCY: 1 — (6A) NUMBER OF BASEMENTS AND CELLARS: 0 — (7A) PRESENT USE: INDUSTRIAL — (8A) BLDG. CODE OCCUP. CLASS: E-4 — (9A) NO. OF DWELLING UNITS: —

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR. 1-hr [X] N 1 2 3 4 5 — (5) NUMBER OF STORIES OF OCCUPANCY: 1 — (6) NUMBER OF BASEMENTS AND CELLARS: 0 — (7) PROPOSED USE: INDUSTRIAL — (8) BLDG. CODE OCCUP. CLASS: E-4 — (9) NO. OF DWELLING UNITS: —

(10A) DOES THIS ALTERATION CREATE ADDITIONAL STORY TO BUILDING? YES ☐ NO ☒
(10) IF YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT: FT.
(11A) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING? YES ☐ NO ☐
(11) IF YES, STATE NEW GROUND FLOOR AREA: SQ. FT.
(14) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REPAIRED OR ALTERED? YES ☐ NO ☒
(15) WILL BUILDING EXTEND BEYOND PROPERTY LINE? YES ☐ NO ☒
(16) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED? YES ☐ NO ☐
(17) WILL STREET SPACE BE USED DURING CONSTRUCTION? YES ☐ NO ☒
(19) ANY OTHER EXISTING BLDG. ON LOT? (IF YES, SHOW ON PLOT PLAN) YES ☒ NO ☐
(20) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY? YES ☐ NO ☒
(21) ELECTRICAL WORK TO BE PERFORMED? YES ☒ NO ☐
(22) PLUMBING WORK TO BE PERFORMED? YES ☒ NO ☐

(23) GENERAL CONTRACTOR: HENRY L. CHAPOT & ASSOCS — ADDRESS: 10 ARKANSAS ST SF — PHONE — CALIF. LICENSE NO. 351150

(24) ARCHITECT OR ENGINEER (DESIGN ☒ CONSTRUCTION ☐): CITY & COUNTY SF — ADDRESS: 949 PRESIDIO AVE SF — CALIF. CERTIFICATE NO.

(25) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN"): UNKNOWN — ADDRESS — 863-2356 PHONE (FOR CONTACT BY BUREAU)

(26) OWNER — (CROSS OUT ONE): MUNICIPAL RAILWAY — ADDRESS

(27) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT):

FURNISH AND INSTALL A NEW WASHROOM INSIDE AN EXISTING STRUCTURE

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See Sec. 103, 104.B, 104.B.1, 104.C, 502, 502.1, San Francisco Building Code and Sec. 104, San Francisco Housing Code.
No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 385, California Penal Code.
Pursuant to Sec. 302.A.8, San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.
Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown revised drawings showing correct grade lines, cuts and fills together with complete details of retaining walls and wall footings required must be submitted to this bureau for approval.
ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.
BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.
APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (15) (16) (17) (20) (21) or (22).
THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.
In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX:
☐ OWNER ☐ ARCHITECT ☐ ENGINEER
☐ LESSEE ☐ AGENT WITH POWER OF ATTORNEY
☐ CONTRACTOR ☐ ATTORNEY IN FACT

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

NOTICE TO APPLICANT

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have on file, or file with the Central Permit Bureau, either Certificate (I) or (II) or (III) designated below or shall indicate Item (IV) or (V) or (VI) below, whichever is applicable. Check one of the following methods of compliance:

( ) I. Certificate of Consent to Self-Insure issued by the Director of Industrial Relations.
(X) II. Certificate of Workman's Compensation Insurance issued by an admitted insurer.
( ) III. An exact copy or duplicate of (I) certified by the Director or (II) certified by the insurer.
( ) IV. The cost of the work to be performed is $100 or less.
( ) V. I certify that in the performance of the work for which this Permit is issued, I shall not employ any person in any manner so as to become subject to the workman's compensation laws of California. I further acknowledge that I understand, in the event that I should become subject to the workman's compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the Permit herein applied for shall be deemed revoked.
( ) VI. I certify as the owner (or the agent of the owner) that in the performance of the work for which this Permit is issued, I will employ a contractor who complies with the workman's compensation laws of California and who has on file, or will file, with the Central Permit Bureau evidence that workman's compensation insurance is carried.

Applicant's Signature: Henry L Chapot — Date: 3-2-79

OFFICIAL COPY

SAN

DEPARTMENT OF BUILDING INSPECTION

REFER TO

CONDITIONS AND STIPULATIONS

APPROVED:

A. Dan 4/23/79
BUILDING INSPECTOR, BUR. OF BLDG. INSP.

DATE:
REASON:
NOTIFIED MR.

APPROVED:

DEPARTMENT OF CITY PLANNING

DATE:
REASON:
NOTIFIED MR.

APPROVED:

BUREAU OF FIRE PREVENTION & PUBLIC SAFETY

DATE:
REASON:
NOTIFIED MR.

APPROVED:

CIVIL ENGINEER, BUR. OF BLDG. INSPECTION

DATE:
REASON:
NOTIFIED MR.

APPROVED:

BUREAU OF ENGINEERING

DATE:
REASON:
NOTIFIED MR.

APPROVED: 4-24-79 To Meet The Building Depts Requirements

M.F. Silverstein M.D., M.P.H.
DEPARTMENT OF PUBLIC HEALTH Per T Dillon

DATE:
REASON:
NOTIFIED MR.

APPROVED:

REDEVELOPMENT AGENCY

DATE:
REASON:
NOTIFIED MR.

APPROVED:

RESIDENTIAL ENV. INSPECTOR, DIV. OF APT. & HOTEL INSP., B.B.I.

DATE:
REASON:
NOTIFIED MR.

APPROVED:

DATE:
REASON:
NOTIFIED MR.

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I AGREE TO COMPLY WITH ALL CONDITIONS OR STIPULATIONS OF THE VARIOUS BUREAUS OR DEPARTMENTS NOTED ON THIS APPLICATION, AND ATTACHED STATEMENTS OF CONDITIONS OR STIPULATIONS, WHICH ARE HEREBY MADE A PART OF THIS APPLICATION.
NUMBER OF ATTACHMENTS ☐

X Jesse E Dewey
SIGNATURE OF OWNER, LESSEE OR AUTHORIZED AGENT FOR OWNER OR LESSEE.

SAN FRANCISCO
DBI
DEPARTMENT OF
BUILDING INSPECTION

OFFICIAL COPY

P FIRE

STRD INSP.
FEES REQ.

C. E. C. O. Req'd.

APPROVED
Dept. of Public Works
JAN 14 1991
SUPERINTENDENT, BUREAU OF BUILDING INSPECTION
Ray Marcotte

APPROVED FOR ISSUANCE: DIST 18; BID-FP; BE; CNTR; DCP; CPB; HID; HEALTH; PAD-ARC; PAD-FD; PAD-STR; PARAPET; PCD; SFRA

TIDF ☐ TITLE 24-2 ☐ YES ☒ NO ☐ ... ☐

DEC 29 1990

BLDG. FORM 3/8

APPLICATION NUMBER 9015741 (9001/07/19)

OSHA APPROVAL REQ'D ☐
APPROVAL NUMBER:

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 ☒ OTHER AGENCIES REVIEW REQUIRED
FORM 8 ☐ OVER-THE-COUNTER ISSUANCE

2 NUMBER OF PLAN SETS

City Job

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS

45,966.75

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF PUBLIC WORKS OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

OFFICE COPY

DO NOT WRITE ABOVE THIS LINE

DATE FILED	FILING FEE RECEIPT NO	(1) STREET ADDRESS OF JOB	BLOCK & LOT
8-2-90	217138	2500 Mariposa St.	[redacted]
PERMIT NO. 663149	ISSUED 1-14-91	(2A) ESTIMATED COST OF JOB $6.5 Million	(2B) REVISED COST: BY: DATE:

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY	(6A) NO. OF BASEMENTS AND CELLARS	(7A) PRESENT USE	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS
Type 1	2	0	OFFICE/REPAIR GARAGE	B2/H4	0

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

10/86

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY	(6) NO. OF BASEMENTS AND CELLARS	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS
Type 1	2	0	OFFICE/REPAIR GARAGE	B2/H4	0

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED? YES ☒ NO ☐	(11) WILL STREET SPACE BE USED DURING CONSTRUCTION? YES ☒ NO ☐	(12) ELECTRICAL WORK TO BE PERFORMED? YES ☒ NO ☐	(13) PLUMBING WORK TO BE PERFORMED? YES ☒ NO ☐

(14) GENERAL CONTRACTOR	ADDRESS	PHONE	CALIF. LIC. NO.	EXPIRATION DATE
TO BE SELECTED				

(15) OWNER - LESSEE (CROSS OUT ONE)	ADDRESS	ZIP	PHONE (FOR CONTACT BY BUREAU)
S.F. Municipal Railway	949 Presidio Ave.	94114	923-6149

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT) 1.☐ 2.☐ 3.☐

Structural/Seismic Rehab of Existing Conc. Building
Remodel of Interior Shop, Maint. and Admin. Spaces
Mechanical/Electrical/Plumbing Alterations

ADDITIONAL INFORMATION — FORM 3 APPLICANTS ONLY

(17) DOES THIS ALTERATION CREATE ADDITIONAL STORY TO BUILDING? YES ☐ NO ☒	(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT FT	(19) DOES THIS ALTERATION CREATE DECK OR HORIZ EXTENSION TO BUILDING? YES ☐ NO ☒	(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA SQ FT
(21) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REPAIRED OR ALTERED? YES ☐ NO ☒	(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE? YES ☐ NO ☒	(23) ANY OTHER EXISTING BLDG ON LOT? (IF YES, SHOW ON PLOT PLAN) YES ☐ NO ☒	(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY? YES ☐ NO ☒

(25) ARCHITECT OR ENGINEER (DESIGN ☒ CONSTRUCTION ☐)	ADDRESS		CALIF. CERTIFICATE NO
James A. Wallsten	1155 Market St.	554-0760	C4229

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN") ADDRESS

UNKNOWN

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 385, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

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THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX
☐ OWNER ☒ ARCHITECT ☐ ENGINEER
☐ LESSEE ☐ AGENT WITH POWER OF ATTORNEY
☐ CONTRACTOR ☐ ATTORNEY IN FACT

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE: The Permittee(s) by acceptance of the permit, agree(s) to indemnify and hold harmless the City and County of San Francisco from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands and actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have on file, or file with the Central Permit Bureau, either Certificate (I) or (II) or (III) designated below or shall indicate item (IV) or (V) or (VI) below, whichever is applicable. If however, item (VI) is checked then item (V) must be checked as well. Mark the appropriate method of compliance below:

( ) I. Certificate of Consent to Self-Insure issued by the Director of Industrial Relations.
( ) II. Certificate of Workman's Compensation Insurance issued by an admitted insurer.
( ) III. An exact copy or duplicate of (I) certified by the Director or (II) certified by the insurer.
( ) IV. The cost of the work to be performed is $100 or less.
(X) V. I certify that in the performance of the work for which this Permit is issued, I shall not employ any person in any manner so as to become subject to the workman's compensation laws of California. I further acknowledge that I understand, in the event that I should become subject to the workman's compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the Permit herein applied for shall be deemed revoked.
X VI. I certify as the owner (or the agent of the owner) that in the performance of the work for which this Permit is issued, I will employ a contractor who complies with the workman's compensation laws of California and who has on file, or prior to the commencement of any work will file, with the Central Permit Bureau evidence that workman's compensation insurance is carried.

[signature] 8/2/90
Applicant's Signature Date

9503-09

SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

OFFICIAL COPY

CONDITIONS AND STIPULATIONS

REFER TO		
	APPROVED: (FIRE) Joseph Lee OCT 2 2 1990 J. Lee — BUILDING INSPECTOR, BUR. OF BLDG. INSP.	DATE: REASON: NOTIFIED MR.
☒	APPROVED: OFFICE COPY 8/31/90 — DEPARTMENT OF CITY PLANNING	DATE: REASON: NOTIFIED MR.
☒	APPROVED: SUBMIT SPRINKLER PLAN PER N.F.P.A. # 13, ~~1978~~ 1989 SEC. 1.9 — 12.5.90 — BUREAU OF FIRE PREVENTION & PUBLIC SAFETY	DATE: REASON: NOTIFIED MR.
☒	SPECIAL INSPECTION AND REPORTS REQUIRED PER SECTION 306. a. b. c. SUBMIT REPORTS TO THE BUREAU OF BLDG. INSPECTION FOR THE FOLLOWING: See notes on dwg. S-1 — Joseph Lee OCT 2 2 1990 J. Lee — CIVIL ENGINEER, BUR. OF BLDG. INSPECTION	DATE: REASON: NOTIFIED MR.
☒	APPROVED: As noted on plans — 12.26.90 — BUREAU OF ENGINEERING	DATE: REASON: NOTIFIED MR.
☐	APPROVED: DEPARTMENT OF PUBLIC HEALTH	DATE: REASON: NOTIFIED MR.
☐	APPROVED: REDEVELOPMENT AGENCY	DATE: REASON: NOTIFIED MR.
☒	APPROVED: Albert Lau 11/30/90 — HOUSING INSPECTION DIVISION PAD-ME	DATE: REASON: NOTIFIED MR.

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments ☐

1/14/91 — OWNER'S AUTHORIZED AGENT

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

ADDRESS OF JOB	BLOCK/LOT	APPLICATION NO.
2500 MARIPOSA ST		9015401

OWNER NAME	TELEPHONE
CITY & CNTY OF SF-MUNI	(415)923-6149

ESTIMATED COST	FILE DATE	DISPOSITION	DISPOSITION DATE	PERMIT NO.	EXPIRE DATE
$6,500,000	8/03/90	ISSUED	01/14/91	663149	01/14/94

FORM CONST. TYPE	OCCUPANCY CODES	PLANS	STORIES	UNITS	DISTRICT
3 1	B-2 H-4	2	2		BID-INSP 18

CONTACT NAME	TELEPHONE
JAMES A. WALLSTEN	(415)554-0760

STANDARD DESCRIPTION/BLDG. USE	OTHER DESCRIPTION
OFFICE	SEISMIC UPGRADE/REMODEL INTERI o OR SHOP/MECHANICAL/PLBG/ELEC

SPECIAL INSPECTIONS? YES

SPECIAL USE DISTRICT

FIRE ZONE

TIDF NO

PENALTY NO

COMPLIANCE WITH REPORTS

NOTES: DEAN 626-4257 CONTRACTOR

SCOTT 255-1611 WED

PERMIT INSPECTION RECORD
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO
BUILDING INSPECTION JOB CARD

9003-15

OFFICIAL COPY

SAN FRANCISCO DATE DEPARTMENT OF BUILDING INSPECTION

BUILDING INSPECTORS JOB RECORD

DATE	
3/1/91	FRAMING IN PROGRESS @ TIRE
/ /	REPAIR & BODY SHOPS
9/19/91	SITE VISIT
9/20/91	SITE VISIT J.M.
10/3/91	SITE VISIT J.M.
10/7/91	"F" LINE OFFICES 103 THRU 115 &
/ /	147 THRU 151 REQUIRE TEMPORARY
/ /	SMOKE DETECTORS, STORAGE RACKS
/ /	IN PARTS ROOM REQUIRE SEISMIC
/ /	BRACING OR CALCS SHOWING
/ /	VERTICAL DISTRIBUTION OF LATERAL
/ /	SEISMIC FORCES J.M.
10/10/91	SITE VISIT J.M. - TEMP. SMOKE
/ /	DETECTORS OK. J.M.
11/27/91	SITE VISIT J.M. - NO PROBLEMS
12/10/91	ISSUED N.O.V. ON SHELVING
5/26/92	SEE CN
7/16/92	TALKED TO SUPERVISOR FROM UPD TOLD TO
/ /	GO GET HARDSHIP R.B.

WORK COMPLETED. FINAL CERTIFICATE POSTED.

APP. NO.

BUILDING INSPECTOR

OFFICIAL COPY

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

FIRE

APPROVED Dept. of Public Works

MAY 14 1991

BLDG. FORM 3/8

APPROVED FOR ISSUANCE MAY 10 1991

DIST 18 | BID-FP | BE | CNTR | CPB | DCP | HID | HEALTH | PAD-ARC | PAD-FD | PAD-ST | PARAPET | PCO | SFRA

TIDF | TITLE 24 | YES | EXPEDITE

HAZARDOUS MATERIALS YES ___ NO X

SUPERINTENDENT BUREAU OF BUILDING INSPECTION

RANDY SPEARS

APPLICATION NUMBER 9030298

OSHA APPROVAL REQ'D ☐ OSHA APPROVAL NUMBER:

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 ☒ OTHER AGENCIES REVIEW REQUIRED

FORM 8 ☐ OVER-THE-COUNTER ISSUANCE

2 CALLS NUMBER OF PLAN SETS 12-30-90

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS

OFFICE COPY

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF PUBLIC WORKS OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

DO NOT WRITE ABOVE THIS LINE

DATE FILED	FILING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK & LOT
12-20-90	222503	2500 MARIPOSA ST	
PERMIT NO. 672207	ISSUED 5-14-91	(2A) ESTIMATED COST OF JOB 12,000-	(2B) REVISED COST: BY: DATE

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY	(6A) NO. OF BASEMENTS AND CELLARS	(7A) PRESENT USE	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS
I	2	0	MUNI REPAIR + STORAGE	B-1	0

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY	(6) NO. OF BASEMENTS AND CELLARS	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS
I	2	0	TIRE STORAGE + REPAIR	B-1 (72)	0

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED? YES ☐ NO ☒ (11) WILL STREET SPACE BE USED DURING CONSTRUCTION? YES ☐ NO ☒ (12) ELECTRICAL WORK TO BE PERFORMED? YES ☐ NO ☒ (13) PLUMBING WORK TO BE PERFORMED? YES ☒ NO ☐ 12-30-91

(14) GENERAL CONTRACTOR: PROGRESSIVE FIRE SPRINKLER — ADDRESS: 328 Commercial ST. SAN JOSE 95112 — CALIF. LIC. NO. 517731 — EXPIRATION DATE 12-30-91 — PHONE 408 298 6555

(15) OWNER - LESSEE (CROSS OUT ONE): PUC — ADDRESS — ZIP — PHONE (FOR CONTACT BY BUREAU)

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT) 1.☐ 2.☐ 3.☐

TIE INTO DOMESTIC WATER + PARTIALLY SPRINKLER AREA.

ADDITIONAL INFORMATION — FORM 3 APPLICANTS ONLY

(17) DOES THIS ALTERATION CREATE ADDITIONAL STORY TO BUILDING? YES ☐ NO ☒ (18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT ___ FT. (19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING? YES ☐ NO ☒ (20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA ___ SQ. FT.

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(25) ARCHITECT OR ENGINEER (DESIGN ☒ CONSTRUCTION ☐): PUC — ADDRESS — CALIF. CERTIFICATE NO.

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN"): UNKNOWN — ADDRESS

IMPORTANT NOTICES

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CHECK APPROPRIATE BOX

☐ OWNER ☐ ARCHITECT ☐ ENGINEER
☐ LESSEE ☐ AGENT WITH POWER OF ATTORNEY
☒ CONTRACTOR ☐ ATTORNEY IN FACT

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( ) I. Certificate of Consent to Self-Insure issued by the Director of Industrial Relations.

(X) II. Certificate of Workmen's Compensation Insurance issued by an admitted insurer.

( ) III. An exact copy or duplicate of (II) certified by the Director or (II) certified by the insurer.

( ) IV. The cost of the work to be performed is $100 or less.

( ) V. I certify that in the performance of the work for which this Permit is issued, I shall not employ any person in any manner so as to become subject to the workmen's compensation laws of California. I further acknowledge that I understand, in the event that I should become subject to the workmen's compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the Permit herein applied for shall be deemed revoked.

( ) VI. I certify as the owner (or the agent of the owner) that in the performance of the work for which this Permit is issued, I will employ a contractor who complies with the workmen's compensation laws of California and who has on file, or prior to the commencement of any work will file, with the Central Permit Bureau evidence that workmen's compensation insurance is carried.

[signature] 12-20-90

Applicant's Signature — Date

9003-83

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

OFFICIAL COPY

CONDITIONS AND STIPULATIONS

REFER TO:		
	APPROVED: FOR WORK AS STATED ONLY CONTACT DISTRICT INSPECTOR NAMED ON PROCESS APPLICATION AT START OF WORK (TELEPHONE NO. 558-6096). THIS APPLICATION IS APPROVED WITHOUT SITE INSPECTION AND DOES NOT CONSTITUTE AN APPROVAL OF THE BUILDING WORK AUTHORIZED MUST BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODE. APPROVED Dept. of Public Works MAY 14 1991 Any electrical or plumbing work will require appropriate separate permits. Sean M. Nulty 12/24/90 BUILDING INSPECTOR, BUR. OF BLDG. INSP.	DATE: REASON: NOTIFIED MR.
☐	APPROVED: N/A Not reviewed by the Department of City Planning. Issuance of the requested permit constitutes no indication that use of this property does or does not conform to the City Planning Code. 12/24/90 DEPARTMENT OF CITY PLANNING	DATE: REASON: NOTIFIED MR.
☒	APPROVED: 5/28/91 BUREAU OF FIRE PREVENTION & PUBLIC SAFETY	DATE: REASON: NOTIFIED MR.
☐	APPROVED: CIVIL ENGINEER, BUR. OF BLDG. INSPECTION	DATE: REASON: NOTIFIED MR.
☐	APPROVED: BUREAU OF ENGINEERING	DATE: REASON: NOTIFIED MR.
☐	APPROVED: DEPARTMENT OF PUBLIC HEALTH	DATE: REASON: NOTIFIED MR.
☐	APPROVED: REDEVELOPMENT AGENCY	DATE: REASON: NOTIFIED MR.
☐	APPROVED: HOUSING INSPECTION DIVISION	DATE: REASON: NOTIFIED MR.

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments ☐

OWNER'S AUTHORIZED AGENT

SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

No. _____ 12/10 19 91

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF BUILDING INSPECTION

CORRECTION NOTICE

Location 2500 MARIPOSA ST

Remarks:

ALL STORAGE RACKS OVER 8' HIGH
MUST COMPLY WITH S.F.B.C. 1988
TABLE 23B

Contact Inspector JIM MOUGH

Rm _____, 450 McAllister or phone: 558-6117

FB 502
B.B.I. Copy

B.C. - Building Code
H.C. - Housing Code
E.C. - Electrical Code
P.C. - Plumbing Code

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF
BUILDING INSPECTION

ADDRESS OF JOB		BLOCK/LOT	APPLICATION NO.
2500 MARIPOSA	ST		9025983

OWNER NAME	TELEPHONE
P.U.C.	

ESTIMATED COST	FILE DATE	DISPOSITION	DISPOSITION DATE	PERMIT NO.	EXPIRE DATE
$12,000	12/24/90	ISSUED	05/14/91	672207	11/14/91

FORM CONST. TYPE	OCCUPANCY CODES	PLANS	STORIES	UNITS	DISTRICT
3 1	B-1	2	2		BID-INSP 18

CONTACT NAME	TELEPHONE
PROGRESSIVE FIRE SPRINKLER MAURICE-DEAN 626-4327	(408)298-6555

STANDARD DESCRIPTION/BLDG. USE	OTHER DESCRIPTION
MUNI CARBARN	TIE INTO DOMESTIC WATER AND PA RTIALLY SPRINKLER AREA

SPECIAL INSPECTIONS? NO

SPECIAL USE DISTRICT

FIRE ZONE

TIDF NO

PENALTY NO

COMPLIANCE WITH REPORTS

NOTES:

PERMIT INSPECTION RECORD
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO
BUILDING INSPECTION JOB CARD

9003-15

OFFICIAL COPY

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

BUILDING INSPECTORS JOB RECORD

DATE	
12/2/91	START WORK J. M.
9/19/91	FIRE DEPT. FINAL 9/9/91
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WORK COMPLETED. FINAL CERTIFICATE POSTED.

APP. NO.

BUILDING INSPECTOR

OFFICIAL COPY

DEPARTMENT OF BUILDING INSPECTION

If the image of this document appears less sharp than this notice, it is due to the quality of the original.

APPROVED

FIRE

PERMIT CONTROL — ACTIVE COMPLAINTS: NONE / HIQ / CED/PCD / BID / DCP / OTHER: 9200270

STATION	HID	CED PCD	BID	DCP	CNT-PC	PAD-PC	PAD-MAJ	SSS	PARAPET	FIRE		HEALTH		
SEQ			1			2								
ACCEPTED			2			1								
APPROVED*														
DATE			5A			5								

CHECK APPLICABLE: ☐ PARALLEL ☐ SITE PENALTY ☐ 9X ☐ 2X
☒ TITLE 24 - HC ☐ TIDF ☐ EXPEDITOR ☐ SFUSD ☐ BLDG ENLARGEMENT (STAMP APPL) *SIGN APPL
☐ HAZARDOUS MATERIAL
COMMENT:

BBI KEY: RESID. = CNT-PC; NON-RESID. = PAD-PC; NEW / MAJOR = PAD-MAJ; UMB = SSS

3/8

APPLICATION NUMBER 9505074 22

OSHA APPROVAL REQ'D ☐ APPROVAL NUMBER:

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 ☒ OTHER AGENCIES REVIEW REQUIRED

FORM 8 ☐ OVER-THE-COUNTER ISSUANCE

2 + cal NUMBER OF PLAN SETS 5-14-95

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF BUILDING INSPECTION OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

▼ DO NOT WRITE ABOVE THIS LINE ▼

DATE FILED	FILING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK & LOT
5/18/95	264707	2500 MARIPOSA ST	

PERMIT NO.	ISSUED	(2A) ESTIMATED COST OF JOB	(2B) REVISED COST:
774931	8-1-95	$11,000	74,000 LTR. DATE: 7/14/95

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY	(6A) NO. OF BASEMENTS AND CELLARS	(7A) PRESENT USE	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS
I	2	0	MUNI RAILWAY	B1 (B2)	0

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY	(6) NO. OF BASEMENTS AND CELLARS	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS
I	2	0	SAME	B2	0

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED? YES ☐ NO ☐
(11) WILL STREET SPACE BE USED DURING CONSTRUCTION? YES ☐ NO ☐
(12) ELECTRICAL WORK TO BE PERFORMED? YES ☒ NO ☐
(13) PLUMBING WORK TO BE PERFORMED? YES ☒ NO ☐

(14) GENERAL CONTRACTOR / ADDRESS / ZIP / PHONE / CALIF. LIC. NO. / EXPIRATION DATE
SAN LUIS GONZAGA CONSTRUCTION, INC 5139 MISSION ST CA 94112 333-7970 687801 4/96

(15) OWNER - LESSEE (CROSS OUT ONE) / ADDRESS / ZIP / PHONE (FOR CONTACT BY DEPT.)
MUNICIPAL RAILWAY 949 PRESIDIO AVE 94115 923-6272

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT) 1. ☐ 2. ☐ 3. ☐

SERVICING, CLEANING, REPAIR AND REPLACEMENT OF FARE COLLECTION ELECTRONIC PROCESSING UNITS, PARTITIONING, PLUMBING MECHANICAL AND ELECTRICAL WORK FOR ELECTRONIC REPAIR SHOP

ADDITIONAL INFORMATION — FORM 3 APPLICANTS ONLY

(17) DOES THIS ALTERATION CREATE ADDITIONAL STORY TO BUILDING? YES ☐ NO ☐
(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT — FT.
(19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING? YES ☐ NO ☐
(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA — SQ. FT.
(21) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REPAIRED OR ALTERED? YES ☐ NO ☒
(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE? YES ☐ NO ☒
(23) ANY OTHER EXISTING BLDG. ON LOT? (IF YES, SHOW ON PLOT PLAN) YES ☐ NO ☒
(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY? YES ☐ NO ☐

(25) ARCHITECT OR ENGINEER (DESIGN ☐ CONSTRUCTION ☐) / ADDRESS / CALIF. CERTIFICATE NO.
MUNI CAPITAL ENGINEERING 1145 MARKET 6th FLOOR C 6552

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN") / ADDRESS
NONE

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 385, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown revised drawings showing correct grade lines, cuts and fills together with complete details of retaining walls and wall footings required must be submitted to this department for approval.

ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.

BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.

APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (10) (11) (12) (13) (22) OR (24).

THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX
☐ OWNER ☐ ARCHITECT ☐ ENGINEER
☐ LESSEE ☐ AGENT WITH POWER OF ATTORNEY
☒ CONTRACTOR ☐ ATTORNEY IN FACT

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

9003-03 (REV. 2/95)

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE: The permittee(s) by acceptance of the permit, agree(s) to indemnify and hold harmless the City and County of San Francisco from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands or actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have coverage under (I), or (II) designated below or shall indicate item (III), or (IV), or (V), whichever is applicable. If however item (V) is checked item (IV) must be checked as well. Mark the appropriate method of compliance below.

I hereby affirm under penalty of perjury one of the following declarations:

( ) I. I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

(✓) II. I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier: Westport Ins. Assoc.

Policy Number: N2034367 A

( ) III. The cost of the work to be done is $100 or less.

( ) IV. I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California. I further acknowledge that I understand that in the event that I should become subject to the workers' compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the permit herein applied for shall be deemed revoked.

( ) V. I certify as the owner (or the agent for the owner) that in the performance of the work for which this permit is issued, I will employ a contractor who complies with the workers' compensation laws of California and who, prior to the commencement of any work, will file a completed copy of this form with the Central Permit Bureau.

Virgilio Tr[illegible] 5/18/95

Signature of Applicant or Agent — Date

OFFICIAL COPY

DEPARTMENT OF BUILDING INSPECTION

CONDITIONS AND STIPULATIONS

APPROVED

Contact the district building inspector at the start of work call 558-6096. For plumbing inspection scheduling call 558-6054, for electrical inspection scheduling call 558-6030. This application is approved without site inspection, detailed plumbing or electrical plan review and does not constitute an approval of the building. Work authorized must be done in strict accordance with all applicable codes. Any electrical or plumbing work shall require appropriate separate permits.

BUILDING INSPECTOR DEPT. OF BLDG. INSP.

DATE

REASON

OK TO CNT-PC

NOTIFIED MR.

APPROVED:

Not reviewed by the Department of City Planning. Issuance of the requested permit constitutes no indication that use of this property does or does not conform to the City Planning Code.

DEPARTMENT OF CITY PLANNING

DATE:

REASON:

NOTIFIED MR.

APPROVED:

REVIEWED BY FIRE DEPT.

FIRE DEPT INSPECTIONS NOT REQUIRED

Alan K DeBella 5/25/95

BUREAU OF FIRE PREVENTION & PUBLIC SAFETY

DATE:

REASON:

NOTIFIED MR.

APPROVED: per plan & applic

SPECIAL INSPECTION AND REPORTS REQUIRED PER SECTION 306. a. b. c. SUBMIT REPORTS TO THE BUREAU OF BLDG. INSPECTION FOR THE FOLLOWING:

SEE DWG S.2.3

5/14/95

CIVIL ENGINEER, DEPT. OF BLDG. INSPECTION

DATE:

REASON:

NOTIFIED MR.

APPROVED:

AS NOTED CEC 113, 123

Albert Lang 6/2/95

BUREAU OF ENGINEERING

M/C

DATE:

REASON:

NOTIFIED MR.

APPROVED:

DEPARTMENT OF PUBLIC HEALTH

DATE:

REASON:

NOTIFIED MR.

REDEVELOPMENT AGENCY

DATE:

REASON:

NOTIFIED MR.

APPROVED:

HOUSING INSPECTION DIVISION

DATE:

REASON:

NOTIFIED MR.

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments [ ]

ADDRESS OF JOB		BLOCK/LOT	APPLICATION NO.
2500 MARIPOSA ST			9507422
OWNER NAME			TELEPHONE
MUNICIPAL RAILWAY			(415)923-6212

ESTIMATED COST	FILE DATE	DISPOSITION	DISPOSITION DATE	PERMIT NO.	EXPIRE DATE
$74,000	5/18/95	ISSUED	08/01/95	774931	08/01/96

FORM CONST. TYPE	OCCUPANCY CODES	PLANS	STORIES	UNITS	DISTRICT
3	1 B-1	2	2		BID-INSP 08

CONTACT NAME	TELEPHONE
SAN LUIS GONZAGA CONSTRUCTION	(415)333-7970

STANDARD DESCRIPTION/BLDG. USE	OTHER DESCRIPTION
MUNI CARBARN	SERVICING, CLEANING, REPAIR, REPLACEMENT OF FARE COLLECT BOX

SPECIAL INSPECTIONS? YES
SPECIAL USE DISTRICT
FIRE ZONE
TIDF NO
PENALTY NO
COMPLIANCE WITH REPORTS

NOTES:

PERMIT INSPECTION RECORD
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO
BUILDING INSPECTION JOB CARD

BXI3-15

DATE	BUILDING INSPECTORS JOB RECORD
8/7/95	RO - frame ok to cover
10/23/95	NO FINAL W/O C/N ITEMS COMPLETE
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JAN 16 1997 EXPIRE per SFBC Sec. 303(d)

WORK COMPLETED. FINAL CERTIFICATE POSTED.

APP. NO. 9507422

BUILDING INSPECTOR

OFFICIAL COPY

SAN
DEP
BUILD

APPROVED
Dept. of Building Insp
MAY 29 1996

APPROVED FOR ISSUANCE
MAY 28 1996

BLDG. FORM 3/8

APPLICATION NUMBER 9609398

OSHA APPROVAL NUMBER:

OK to issue
BID 9200269
BIO 9200228

Dist 8

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 ☐ OTHER AGENCIES REVIEW REQUIRED

FORM 8 ☒ OVER-THE-COUNTER ISSUANCE

0 NUMBER OF PLAN SETS 5-14-97

▼ DO NOT WRITE ABOVE THIS LINE ▼

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF BUILDING INSPECTION OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

OFFICIAL COPY

DATE FILED	FILING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK & LOT
5-28-96		2500 MARIPOSA	
PERMIT NO. 795033 ~~796823~~	ISSUED 5-29-96 ~~5-28-96~~	(2A) ESTIMATED COST OF JOB 30,000.	(2B) REVISED COST. BY: DATE:

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

LEGAL DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY:	(6A) NO. OF BASEMENTS AND CELLARS:	(7A) PRESENT USE	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS:
1	2		MUNI CAR BARN	S-3	0 72

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY:	(6) NO. OF BASEMENTS AND CELLARS:	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS:
1	2		MUNI CAR BARN	S-3	0

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED?	(11) WILL STREET SPACE BE USED DURING CONSTRUCTION?	(12) ELECTRICAL WORK TO BE PERFORMED?	(13) PLUMBING WORK TO BE PERFORMED?
YES ☐ NO ☒	YES ☐ NO ☒	YES ☒ NO ☐	YES ☒ NO ☐

(14) GENERAL CONTRACTOR	ADDRESS	ZIP	PHONE	CALIF. LIC. NO.	EXPIRATION DATE
SAN LUIS GONZAGA Const	5739 Mission			CG87801	9/30/98

(15) OWNER - LESSEE (CROSS OUT ONE)	ADDRESS	ZIP	BTMC #	PHONE (FOR CONTACT BY DEPT.)
S.F MUNI RAILWAYS				

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT)

TO RENEW PERMIT APPLICATION NO. 9507422

~~NATURE OF REMAINING WORK~~ 30 days ~~DESCRIPTION OF REMAINING WORK~~ complete Mechanical room + final inspection

NOTE: INCORRECT DESCRIPTION OF THE REMAINING WORK OR INCORRECT VALUATION MAY RESULT IN THE REQUIREMENT TO PAY ADDITIONAL FEES OR FILE AN ADDITIONAL PERMIT APPLICATION TO ACCURATELY DESCRIBE THE WORK.

ADDITIONAL INFORMATION

(17) DOES THIS ALTERATION CREATE ADDITIONAL HEIGHT OR STORY TO BUILDING?	(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT FT	(19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING?	(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA SQ. FT
YES ☐ NO ☐		YES ☐ NO ☐	

(21) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REMOVED OR ALTERED?	(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE?	(23) ANY OTHER EXISTING BLDG ON LOT? (IF YES, SHOW ON PLOT PLAN)	(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY?
YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐

(25) ARCHITECT OR ENGINEER (DESIGN ☐ CONSTRUCTION ☐)	ADDRESS	CALIF. CERTIFICATE NO

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN")	ADDRESS

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 385, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown revised drawings showing correct grade lines, cuts and fills together with complete details of retaining walls and wall footings required must be submitted to this department for approval.

ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.

BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.

APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (10), (11), (12), (13), (22) OR (24).

THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX

☐ OWNER ☐ ARCHITECT
☐ LESSEE ☐ AGENT
☒ CONTRACTOR ☐ ENGINEER

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

9003-03 REV. 1 '96

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE: The permittee(s) by acceptance of the permit agree(s) to indemnify and hold harmless the City and County of San Francisco from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands or actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have coverage under (I), or (II) designated below or shall indicate item (III), or (IV), or (V), whichever is applicable. If however item (V) is checked item (IV) must be checked as well. Mark the appropriate method of compliance below.

I hereby affirm under penalty of perjury one of the following declarations:

( ) I I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

(✓) II I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier CALIFORNIA INDEMNITY INS. CO.

Policy Number N20422188

( ) III The cost of the work to be done is $100 or less.

( ) IV I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California. I further acknowledge that I understand that in the event that I should become subject to the workers compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the permit herein applied for shall be deemed revoked.

( ) V I certify as the owner (or the agent for the owner) that in the performance of the work for which this permit is issued, I will employ a contractor who complies with the workers' compensation laws of California and who, prior to the commencement of any work, will file a completed copy of this form with the Central Permit Bureau.

Virgilio Talao 5/28/96

Signature of Applicant or Agent — Date

OFFICIAL COPY

SAN

DEP
BUILD

CONDITIONS AND STIPULATIONS

REFER TO

APPROVED:

DATE:

REASON:

Contact the district building inspector at the start of work call 558-6096. For plumbing inspection scheduling call 558-6054, for electrical inspection scheduling call 558-6030. This application is approved without site inspection, detailed plumbing or electrical plan review and does not constitute an approval of the building. Work authorized must be done in strict accordance with all applicable codes. Any electrical or plumbing work shall require appropriate separate permits.

CHECKED BY
Depal
Date MAY 28 1986

NOTIFIED MR.

APPROVED:

DATE:

REASON:

DEPARTMENT OF CITY PLANNING

NOTIFIED MR.

APPROVED:

DATE:

REASON:

BUREAU OF FIRE PREVENTION & PUBLIC SAFETY

NOTIFIED MR.

APPROVED:

DATE:

REASON:

CIVIL ENGINEER, DEPT OF BLDG & INSPECTION

NOTIFIED MR.

APPROVED:

DATE:

REASON:

BUREAU OF ENGINEERING

NOTIFIED MR.

APPROVED:

DATE:

REASON:

DEPARTMENT OF PUBLIC HEALTH

NOTIFIED MR

DATE:

REASON:

NOTIFIED MR.

APPROVED:

DATE:

REASON:

NOTIFIED MR

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

ADDRESS OF JOB		BLOCK/LOT	APPLICATION NO
2500 MARIPOSA	ST		9609398

OWNER NAME	TELEPHONE
S.F. MUNI RAILWAY	

ESTIMATED COST	FILE DATE	DISPOSITION	DISPOSITION DATE	PERMIT NO	EXPIRE DATE
$30,000	5/29/96	ISSUED	05/29/96	795033	05/29/97

FORM CONST. TYPE	OCCUPANCY CODES	PLANS	STORIES	UNITS	DISTRICT
8 1	S-3	0	2		BID-INSP 08

CONTACT NAME	TELEPHONE
SAN LUIS GONZAGA CONSTRUCTION	(415)333-7970

STANDARD DESCRIPTION/BLDG. USE	OTHER DESCRIPTION
MUNI CARBARN	RENEW PA #9507422 TO COMPLETE MECHANICAL RM & FINAL INSPECT.

SPECIAL INSPECTIONS?	NO	FIRE ZONE	
SPECIAL USE DISTRICT		TIDF	NO
		PENALTY	NO

COMPLIANCE WITH REPORTS

NOTES:

PERMIT INSPECTION RECORD
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO
BUILDING INSPECTION JOB CARD

9003-15

OFFICIAL COPY

DATE	BUILDING INSPECTORS JOB RECORD
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/ /	EXPIRE per SFBC Sec. 106.4.4
/ /	

~~WORK COMPLETED. FINAL CERTIFICATE POSTED~~

APP. NO. 9609398

BUILDING INSPECTOR

OFFICIAL COPY

SAN
DEP
BUILD

ENT OF
SPECTION

APPROVED
Dept of Building Insp.
FEB 05 1999

DIRECTOR
DEPT OF BUILDING INSPECTION

APPROVED FOR ISSUANCE

FEB 05 1999 9902338

BLDG. FORM 3/8

APPLICATION NUMBER

OSHA APPROVAL REQ'D ☐

OSHA APPROVAL NUMBER:

REROOFING

REQUESTS FOR REQUIRED REROOFING INSPECTION MAY BE MADE DAY OR NIGHT BY CALLING 415-558-6091

SEPARATE FIRE PERMIT REQUIRED IF USING LIQUEFIED PETROLEUM GAS (L.P.G.). APPLY AT 260 GOLDEN GATE AVE, RM 327, PHONE 861 3000, EXT 310. APPLICANT RESPONSIBLE FOR STREET USE PERMIT(S)

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 ☐ OTHER AGENCIES REVIEW REQUIRED

FORM 8 ☑ OVER-THE-COUNTER ISSUANCE

0 NUMBER OF PLAN SETS

12/31/99

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

OFFICE COPY

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF BUILDING INSPECTION OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

▼ DO NOT WRITE ABOVE THIS LINE ▼

DATE FILED	FILING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK & LOT
2-05-99		2500 Mariposa Street	3971/1
PERMIT NO.	**ISSUED**	**(2A) ESTIMATED COST OF JOB**	**(2B) REVISED COST:**
870835	2/5/99	$ 1, 152,595.00	BY: DATE:

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

LEGAL DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY:	(6A) NO. OF BASEMENTS AND CELLARS:	(7A) PRESENT USE:	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS:
concrete	2	0	Parking & Maint. of Electric Buses	S-4	0

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY:	(6) NO. OF BASEMENTS AND CELLARS:	(7) PROPOSED USE (LEGAL USE):	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS:
concrete	2	0	Parking & Maint. of Electric Buses	S-4	0

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED?	(11) WILL STREET SPACE BE USED DURING CONSTRUCTION?	(12) ELECTRICAL WORK TO BE PERFORMED?	(13) PLUMBING WORK TO BE PERFORMED?
YES ☐ NO ☒	YES ☒ NO ☐	YES ☐ NO ☒	YES ☐ NO ☒

(14) GENERAL CONTRACTOR	ADDRESS	ZIP	PHONE	CALIF. LIC. NO.	EXPIRATION DATE
Western Roofing Service	2594 Oakdale Ave. S.F. CA	94124	(415) 648-6472	180533	5/31/00

(15) OWNER - LESSEE (CROSS OUT ONE)	ADDRESS	ZIP	BTRC #	PHONE (FOR CONTACT BY DEPT.)
City & County of S.F. Public Transportation Commission	1145 Market St. 5th Fl. S.F. CA	94103-1545		

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT)

Install New Roofing System at the Administration Building, Install New Deck Coating System at the Elevated Parking Deck.

ADDITIONAL INFORMATION

(17) DOES THIS ALTERATION CREATE ADDITIONAL HEIGHT OR STORY TO BUILDING?	(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT	(19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING?	(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA
YES ☐ NO ☒	FT.	YES ☐ NO ☒	SQ. FT.

(21) WILL SIDEWALK OVER BUS-SIDEWALK SPACE BE REPAIRED OR ALTERED?	(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE?	(23) ANY OTHER EXISTING BLDG. ON LOT? (IF YES, SHOW ON PLOT PLAN)	(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY?
YES ☐ NO ☒	YES ☐ NO ☒	YES ☐ NO ☒	YES ☐ NO ☒

(25) ARCHITECT OR ENGINEER (DESIGN ☐ CONSTRUCTION ☐)	ADDRESS	CALIF. CERTIFICATE NO.
Peter Gabancho	1145 Market Street, 6th Floor, San Francisco, CA 94103	

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY, IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN").	ADDRESS
Unknown	

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 365, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown revised drawings showing correct grade lines, cuts and fills together with complete details of retaining walls and wall footings required must be submitted to this department for approval.

ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.

BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.

APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (10) (11) (12) (13) (22) OR (24).

THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX

☐ OWNER ☐ ARCHITECT
☐ LESSEE ☐ AGENT
☒ CONTRACTOR ☐ ENGINEER

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

9003-03 (REV. 1/96)

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE: The permittee(s) by acceptance of the permit, agree(s) to indemnify and hold harmless the City and County of San Francisco from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands or actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have coverage under (I), or (II) designated below or shall indicate item (III), or (IV), or (V), whichever is applicable. If however item (V) is checked item (IV) must be checked as well. Mark the appropriate method of compliance below:

I hereby affirm under penalty of perjury one of the following declarations:

( ) I. I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

(X) II. I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier Majestic Ins. Co.

Policy Number C19990203901

( ) III. The cost of the work to be done is $100 or less.

( ) IV. I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California. I further acknowledge that I understand that in the event that I should become subject to the workers' compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the permit herein applied for shall be deemed revoked.

( ) V. I certify as the owner (or the agent for the owner) that in the performance of the work for which this permit is issued, I will employ a contractor who complies with the workers' compensation laws of California and who, prior to the commencement of any work, will file a completed copy of this form with the Central Permit Bureau.

Signature of Applicant or Agent — Date: 2/5/99

NT OF
ECTION
REFER TO:

CONDITIONS AND STIPULATIONS

APPROVED:

CHECKED BY:
Department of Building Inspection
Date: FEB 05 1999

BUILDING INSPECTOR, DEPT. OF BLDG.

DATE:
REASON:
NOTIFIED MR.

APPROVED:

DEPARTMENT OF CITY PLANNING

DATE:
REASON:
NOTIFIED MR.

APPROVED:

BUREAU OF FIRE PREVENTION & PUBLIC SAFETY

DATE:
REASON:
NOTIFIED MR.

APPROVED:

CIVIL ENGINEER, DEPT. OF BLDG. INSPECTION

DATE:
REASON:
NOTIFIED MR.

APPROVED: P/A

BUREAU OF ENGINEERING

DATE:
REASON:
NOTIFIED MR.

APPROVED:

DEPARTMENT OF PUBLIC HEALTH

DATE:
REASON:
NOTIFIED MR.

REDEVELOPMENT AGENCY

DATE:
REASON:
NOTIFIED MR.

APPROVED:

HOUSING INSPECTION DIVISION

DATE:
REASON:
NOTIFIED MR.

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments

OWNER'S AUTHORIZED AGENT

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF
BUILDING INSPECTION

ADDRESS OF JOB		BLOCK/LOT	APPLICATION NO
2500 MARIPOSA ST			9902338
OWNER NAME			TELEPHONE
CITY & COUNTY OF S.F. PUBLIC			
ESTIMATED COST	FILE DATE	DISPOSITION	DISPOSITION DATE	PERMIT NO	EXPIRE DATE
$1,152,595	2/05/99	ISSUED	02/05/99	870835	08/05/01
FORM CONST. TYPE	OCCUPANCY CODES	PLANS	STORIES	UNITS	DISTRICT
8	S-4	0			BID-INSP 08
CONTACT NAME					TELEPHONE
WESTERN ROOFING SERVICE					648-6472

STANDARD DESCRIPTION/BLDG. USE	OTHER DESCRIPTION
MUNI CARBARN	REROOFING

SPECIAL INSPECTIONS? NO
SPECIAL USE DISTRICT
FIRE ZONE
TIDF NO
PENALTY NO
COMPLIANCE WITH REPORTS

NOTES:

PERMIT INSPECTION RECORD
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO
BUILDING INSPECTION JOB CARD

9003-15

SAN
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DATE	BUILDING INSPECTORS JOB RECORD
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8/31/01	EXPIRE per SFBC Sec. 106.4.4
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~~WORK COMPLETED. FINAL CERTIFICATE POSTED.~~

APP. NO.
9902338

BUILDING INSPECTOR

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

APPROVED
Dept of Building Insp.
OCT 02 2001
DIRECTOR
DEPT OF BUILDING INSPECTION

APPROVED FOR ISSUANCE
JUN 05 2001

BLDG. FORM 3/8

APPLICATION NUMBER 2001/01/2364

OSHA APPROVAL NUMBER:

APPLICATION FOR BUILDING PERMIT
ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 [X] OTHER AGENCIES REVIEW REQUIRED

FORM 8 [ ] OVER-THE-COUNTER ISSUANCE

2+calc+spc NUMBER OF PLAN SETS

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF BUILDING INSPECTION OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

OFFICIAL COPY

▼ DO NOT WRITE ABOVE THIS LINE ▼

DATE FILED	FILING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK/LOT
1-23-2001	City Job	2500 MARIPOSA STREET	~~4075/6~~ 3974/01

PERMIT NO.	ISSUED	(2A) ESTIMATED COST OF JOB	(2B) REVISED COST:
949917	10/2/01	$348000	BY: DATE:

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

LEGAL DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY:	(6A) NO. OF BASEMENTS AND CELLARS:	(7A) PRESENT USE:	(8A) OCCUP. CLASS:	(9A) NO. OF DWELLING UNITS:
1	2		TROLLEY COACH MAINTENANCE FACILITY (MUNI)	B, H4, F2, H7 (4) (10)	—

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY:	(6) NO. OF BASEMENTS AND CELLARS:	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS:
1	2		TROLLEY COACH MAINTENANCE FACILITY (MUNI)	B, F2, H7 H4	—

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED?	(11) WILL STREET SPACE BE USED DURING CONSTRUCTION?	(12) ELECTRICAL WORK TO BE PERFORMED?	(13) PLUMBING WORK TO BE PERFORMED?
YES [ ] NO [X]	YES [ ] NO [X]	YES [X] NO [ ]	YES [X] NO [ ]

(14) GENERAL CONTRACTOR	ADDRESS	ZIP	PHONE	CALIF. LIC. NO.	EXPIRATION DATE
Jerky Construction	2455 Franklin SF Ca	94123	776-2957	737144	6-03

(15) OWNER / LESSEE (CROSS OUT ONE)	ADDRESS	ZIP	BTRC #	PHONE (FOR CONTACT BY DEPT.)
SAN FRANCISCO MUNI RAILWAY	1145 Market	E/F	(PM) LISA CHOW (PE) DAVID TONG	554-1890 557-9969

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT)

(1) CONVERSION OF AN EXISTING LOCKSHOP INTO AN ELECTRONICS SHOP FOR TESTING OF NEW ETI TROLLEY BUS ELECTRONICS COMPONENTS
(2) ADA UPGRADE IN MENS & WOMENS RESTROOM (ADA PARKING)
(3) BATTERY ROOM UPGRADE
(4) CONFERENCE ROOM AND LUNCH ROOM (RENOVATIONS)
(5) HEAVY REPAIR BAY - OPENING ENLARGEMENT

ADDITIONAL INFORMATION

(17) DOES THIS ALTERATION CREATE ADDITIONAL HEIGHT OR STORY TO BUILDING?	(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT	(19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING?	(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA
YES [ ] NO [X]	FT.	YES [ ] NO [ ]	SQ. FT.

(21) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REPAIRED OR ALTERED?	(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE?	(23) ANY OTHER EXISTING BLDG. ON LOT? (IF YES, SHOW ON PLOT PLAN)	(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY?
YES [ ] NO [X]	YES [ ] NO [X]	YES [X] NO [ ]	YES [X] NO [ ]

(25) ARCHITECT OR ENGINEER (DESIGN [ ] CONSTRUCTION [ ])	ADDRESS	CALIF. CERTIFICATE NO.
PARSONS BRINCKERHOFF	303 2nd STREET, SUITE 700N SAN FRANCISCO	

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN") — ADDRESS

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 365, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown revised drawings showing correct grade lines, cuts and fills together with complete details of retaining walls and wall footings required must be submitted to this department for approval.

ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.

BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.

APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (10) (11) (12) (13) (22) OR (24).

THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX

[ ] OWNER [ ] ARCHITECT
[ ] LESSEE [ ] AGENT
[ ] CONTRACTOR [X] ENGINEER

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

9003-03 (REV. 1/96)

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE: The permittee(s) by acceptance of the permit, agree(s) to indemnify and hold harmless the City and County of San Francisco, from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands or actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have coverage under (I), or (II) designated below or shall indicate item (III), or (IV), or (V), whichever is applicable. If however item (V) is checked item (V) must be checked as well. Mark the appropriate method of compliance below:

I hereby affirm under penalty of perjury one of the following declarations:

( ) I. I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

( ) II. I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier _____

Policy Number _____

( ) III. The cost of the work to be done is $100 or less.

(X) IV. I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California. I further acknowledge that I understand that in the event that I should become subject to the workers' compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the permit herein applied for shall be deemed revoked.

(X) V. I certify as the owner (or the agent for the owner) that in the performance of the work for which this permit is issued, I will employ a contractor who complies with the workers' compensation laws of California and who, prior to the commencement of any work, will file a completed copy of this form with the Central Permit Bureau.

(SFMUNI Proj. Engr) 1/23/2001

Signature of Applicant or Agent — Date

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF
BUILDING INSPECTION

CONDITIONS AND STIPULATIONS

REFER TO:

APPROVED:

Contact the district building inspector at the start of work call 558-6096. For plumbing inspection scheduling call 558-6054, for electrical inspection scheduling call 558-6030. This application is approved without site inspection, detailed plumbing or electrical plan review and does not constitute an approval of the building. Work authorized must be done in strict accordance with all applicable codes. Any electrical or plumbing work shall require appropriate separate permits.

By Wing Tang
WING T. GEE, DBI

APR 11 2001

BUILDING INSPECTOR, DEPT. OF BLDG. INSP. 6/4/01 WK

DATE:
REASON:
NOTIFIED MR.

☒ APPROVED:

Approved per plan and specifications and attached Conditions of Approval dated 2001.0331R

6.1.01

DEPARTMENT OF CITY PLANNING

DATE:
REASON:
NOTIFIED MR.

☒ APPROVED:

REVIEWED BY FIRE DEPT.
FIRE DEPT INSPECTIONS NOT REQUIRED

FOR TIM CRAWFORD 6/4/01

BUREAU OF FIRE PREVENTION & PUBLIC SAFETY

DATE:
REASON:
NOTIFIED MR.

☒ APPROVED:

SPECIAL INSPECTIONS AND TESTING RECORDS PER BUILDING CODE SECTION 1701

By Wing Tang
WING T. GEE, DBI

APR 11 2001

CIVIL ENGINEER, DEPT. OF BLDG. INSPECTION 6/4/01 WK

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

N/A

BUREAU OF ENGINEERING

DATE:
REASON:
NOTIFIED MR.

☒ APPROVED:

By
TIECHENG HU, DBI

M.E.

~~DEPARTMENT OF PUBLIC HEALTH~~ APR 26 2001

DATE:
REASON:
NOTIFIED MR.

☐

REDEVELOPMENT AGENCY

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

N/A

HOUSING INSPECTION DIVISION

DATE:
REASON:
NOTIFIED MR.

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments ☐

OWNER'S AUTHORIZED AGENT

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

APPROVED
Dept. of Building Insp.
FEB 0 7 2002
DIRECTOR
DEPT OF BUILDING INSPECTION

APPROVED FOR ISSUANCE 2/7/02

APPLICATION NUMBER 2002/02/07/8692

G. 3/8

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

FORM 3 ☐ OTHER AGENCIES REVIEW REQUIRED

FORM 8 ☒ OVER-THE-COUNTER ISSUANCE

2 + PEF. NUMBER OF PLAN SETS

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF BUILDING INSPECTION OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

OFFICIAL COPY

OSHA APPROVAL REQ'D ☐
OSHA APPROVAL NUMBER:

DO NOT WRITE ABOVE THIS LINE

DATE FILED	FILING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK & LOT
2/7/02		(Potrero Facility) 2500 Mariposa Street	3971/01

PERMIT NO.	ISSUED	(2A) ESTIMATED COST OF JOB	(2B) REVISED COST:
~~2001-01-23-0430~~ 958853	2/7/2002	$1 - permit	1 - Back check (2) Hrs. BY: WG DATE: 2/7/02

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

LEGAL DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY:	(6A) NO. OF BASEMENTS AND CELLARS:	(7A) PRESENT USE:	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS:
1	2		Muni Trolley Coach Maintenance Facility	H4 (4) (10)	ϕ

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY:	(6) NO. OF BASEMENTS AND CELLARS:	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS:
1	2		Muni Trolley Coach Maintenance Facility	B, H4	ϕ

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED? YES ☐ NO ☒
(11) WILL STREET SPACE BE USED DURING CONSTRUCTION? YES ☐ NO ☒
(12) ELECTRICAL WORK TO BE PERFORMED? YES ☒ NO ☐
(13) PLUMBING WORK TO BE PERFORMED? YES ☒ NO ☐

(14) GENERAL CONTRACTOR: Unknown ~~Jersey Constructors, 2455 Franklin Street, S.F., 94123 (415) 776-2957 737144 6-20-03~~
ADDRESS / ZIP / PHONE / CALIF. LIC. NO. / EXPIRATION DATE

(15) OWNER - LESSEE (CROSS OUT ONE) / ADDRESS / ZIP / BTRC # / PHONE (FOR CONTACT BY DEPT.)
San Francisco Municipal Railway 1145 Market St., 5th Fl. S.F. 94103 (415) 554-1890 Lisa Chow - 554-1890

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT)
Revision to permit no. 2001-01-23-0430 (to correct occupancy classification)

ADDITIONAL INFORMATION

(17) DOES THIS ALTERATION CREATE ADDITIONAL HEIGHT OR STORY TO BUILDING? YES ☐ NO ☒
(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT FT.
(19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING? YES ☐ NO ☒
(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA SQ. FT.
(21) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REPAIRED OR ALTERED? YES ☐ NO ☒
(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE? YES ☐ NO ☒
(23) ANY OTHER EXISTING BLDG. ON LOT? (IF YES, SHOW ON PLOT PLAN) YES ☒ NO ☐
(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY? YES ☐ NO ☒

(25) ARCHITECT OR ENGINEER (DESIGN ☐ CONSTRUCTION ☐) / ADDRESS / CALIF. CERTIFICATE NO.
Parsons Brinckerhoff 303 Second St., Suite 700N, S.F.

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN"). / ADDRESS

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction, to be closer than 6'0" to any wire containing more than 750 volts. See Sec. 385, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown revised drawings showing correct grade lines, cuts and fills together with complete details of retaining walls and wall footings required must be submitted to this department for approval.

ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.

BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.

APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (10) (11) (12) (13) (22) OR (24).

THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX
☐ OWNER ☐ ARCHITECT
☐ LESSEE ☒ AGENT
☐ CONTRACTOR ☐ ENGINEER

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

9003-03 (REV. 1/96)

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE: The permittee(s) by acceptance of the permit, agree(s) to indemnify and hold harmless the City and County of San Francisco from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands or actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have coverage under (I), or (II) designated below or shall indicate item (III), or (IV), or (V), whichever is applicable. If however item (V) is checked item (IV) must be checked as well. Mark the appropriate method of compliance below:

I hereby affirm under penalty of perjury one of the following declarations:

( ) I. I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

(✓) II. I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier ~~State Fund~~

Policy Number ~~64400 UNK~~

( ) III. The cost of the work to be done is $100 or less.

X IV. I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California. I further acknowledge that I understand that in the event that I should become subject to the workers' compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the permit herein applied for shall be deemed revoked.

X V. I certify as the owner (or the agent for the owner) that in the performance of the work for which this permit is issued, I will employ a contractor who complies with the workers' compensation laws of California and who, prior to the commencement of any work, will file a completed copy of this form with the Central Permit Bureau.

Lisa Chow — Signature of Applicant or Agent

2/7/02 — Date

OFFICIAL COPY

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

CONDITIONS AND STIPULATIONS

REFER TO: APPROVED:

Contact the district building inspector at the start of work call [illegible]. For plumbing inspection scheduling call [illegible], for electrical inspection scheduling call [illegible]. This application is approved without site inspection, detailed plumbing or electrical plans [illegible] and does not constitute an approval of the building. Work authorized must be done in strict accordance with all applicable codes. Any electrical or plumbing work shall require appropriate separate permits.

By WING T. GEE, DBI

FEB 07 2002

BUILDING INSPECTOR, DEPT. OF BLDG. INSP.

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

DEPARTMENT OF CITY PLANNING

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

BUREAU OF FIRE PREVENTION & PUBLIC SAFETY

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

CIVIL ENGINEER, DEPT. OF BLDG. INSPECTION

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

N/A

BUREAU OF ENGINEERING

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

DEPARTMENT OF PUBLIC HEALTH

DATE:
REASON:
NOTIFIED MR.

☐

REDEVELOPMENT AGENCY

DATE:
REASON:
NOTIFIED MR.

☐ APPROVED:

HOUSING INSPECTION DIVISION

DATE:
REASON:
NOTIFIED MR.

HOLD SECTION — NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments ☐

OWNER'S AUTHORIZED AGENT

OFFICIAL COPY

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

APPROVED Dept. of Building Insp.

NOV 10 2015

Tom C. Hui
TOM C. HUI, S.E.
DIRECTOR
DEPT. OF BUILDING INSPECTION

NV

REVIEWED BY FIRE DEPT.

FIRE DEPT INSPECTIONS NOT REQUIRED

APPROVED FOR ISSUANCE NOV 10 2015

BLDG. FORM 3/8

APPLICATION NUMBER 201510169984

OSHA APPROVAL NUMBER APPROVAL REQ'D ☐

APPLICATION FOR BUILDING PERMIT ADDITIONS, ALTERATIONS OR REPAIRS

11/25-2015

FORM 3 ☐ OTHER AGENCIES REVIEW REQUIRED

FORM 8 ☑ OVER-THE-COUNTER ISSUANCE

2 NUMBER OF PLAN SETS

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

APPLICATION IS HEREBY MADE TO THE DEPARTMENT OF BUILDING INSPECTION OF SAN FRANCISCO FOR PERMISSION TO BUILD IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH AND ACCORDING TO THE DESCRIPTION AND FOR THE PURPOSE HEREINAFTER SET FORTH.

▼ DO NOT WRITE ABOVE THIS LINE ▼

DATE FILED	BUILDING FEE RECEIPT NO.	(1) STREET ADDRESS OF JOB	BLOCK & LOT
NOV 10 2015		2500 Mariposa Street	3971/001
PERMIT NO.	**ISSUED**	**(22) ESTIMATED COST OF JOB**	**(23) REVISED COST:**
1375129	NOV 10 2015	$20,000.00	BY: 20,000.00 DATE: 10/16/15

INFORMATION TO BE FURNISHED BY ALL APPLICANTS

LEGAL DESCRIPTION OF EXISTING BUILDING

(4A) TYPE OF CONSTR.	(5A) NO. OF STORIES OF OCCUPANCY:	(6A) NO. OF BASEMENTS AND CELLARS:	(7A) PRESENT USE:	(8A) OCCUP. CLASS	(9A) NO. OF DWELLING UNITS:
1	2	0	SFMTA Muni Building	H4 + B	0

DESCRIPTION OF BUILDING AFTER PROPOSED ALTERATION

(4) TYPE OF CONSTR.	(5) NO. OF STORIES OF OCCUPANCY:	(6) NO. OF BASEMENTS AND CELLARS:	(7) PROPOSED USE (LEGAL USE)	(8) OCCUP. CLASS	(9) NO. OF DWELLING UNITS:
1	2	0	SFMTA Muni Building	H4 + B (H4)	0

(10) IS AUTO RUNWAY TO BE CONSTRUCTED OR ALTERED?	(11) WILL STREET SPACE BE USED DURING CONSTRUCTION?	(12) ELECTRICAL WORK TO BE PERFORMED?	(13) PLUMBING WORK TO BE PERFORMED?
YES ☐ NO ☒	YES ☐ NO ☒	YES ☒ NO ☐	YES ☐ NO ☒

(14) GENERAL CONTRACTOR	ADDRESS	ZIP	PHONE	CALIF. LIC. NO.	EXPIRATION DATE
Champion Telecom	401 Whitney Pl, Fremont	501	2768525	980705	1/2017

(15) OWNER - LESSEE (CROSS OUT ONE)	ADDRESS	ZIP	BTRC#	PHONE (FOR CONTACT BY DEPT.)
SFMTA / South Van Ness		94103		

(16) WRITE IN DESCRIPTION OF ALL WORK TO BE PERFORMED UNDER THIS APPLICATION (REFERENCE TO PLANS IS NOT SUFFICIENT)

Install DIS server. Instal One electrical curcuit with 4gang receptical. Install Antenas and cables DC+ Fiberoptic. Instal new control station.

ADDITIONAL INFORMATION

(17) DOES THIS ALTERATION CREATE ADDITIONAL HEIGHT OR STORY TO BUILDING?	(18) IF (17) IS YES, STATE NEW HEIGHT AT CENTER LINE OF FRONT	(19) DOES THIS ALTERATION CREATE DECK OR HORIZ. EXTENSION TO BUILDING?	(20) IF (19) IS YES, STATE NEW GROUND FLOOR AREA SQ. FT.
YES ☐ NO ☒		YES ☐ NO ☒	

(21) WILL SIDEWALK OVER SUB-SIDEWALK SPACE BE REPAIRED OR ALTERED?	(22) WILL BUILDING EXTEND BEYOND PROPERTY LINE?	(23) ANY OTHER EXISTING BLDG. ON LOT? (IF YES, SHOW ON PLOT PLAN)	(24) DOES THIS ALTERATION CONSTITUTE A CHANGE OF OCCUPANCY?
YES ☐ NO ☒	YES ☐ NO ☒	YES ☒ NO ☐	YES ☐ NO ☒

(25) ARCHITECT OR ENGINEER (DESIGN ☒ CONSTRUCTION ☐)	ADDRESS	CALIF. CERTIFICATE NO.
Brian Burkhard	300 Frank Ogawa Plaza, Oakland	E 19617

(26) CONSTRUCTION LENDER (ENTER NAME AND BRANCH DESIGNATION IF ANY. IF THERE IS NO KNOWN CONSTRUCTION LENDER, ENTER "UNKNOWN") ADDRESS

IMPORTANT NOTICES

No change shall be made in the character of the occupancy or use without first obtaining a Building Permit authorizing such change. See San Francisco Building Code and San Francisco Housing Code.

No portion of building or structure or scaffolding used during construction is to be closer than 6'0" to any wire containing more than 750 volts. See Sec 385, California Penal Code.

Pursuant to San Francisco Building Code, the building permit shall be posted on the job. The owner is responsible for approved plans and application being kept at building site.

Grade lines as shown on drawings accompanying this application are assumed to be correct. If actual grade lines are not the same as shown, revised drawings showing correct grade lines, cuts and fills, and complete details of retaining walls and wall footings must be submitted to this department for approval.

ANY STIPULATION REQUIRED HEREIN OR BY CODE MAY BE APPEALED.

BUILDING NOT TO BE OCCUPIED UNTIL CERTIFICATE OF FINAL COMPLETION IS POSTED ON THE BUILDING OR PERMIT OF OCCUPANCY GRANTED, WHEN REQUIRED.

APPROVAL OF THIS APPLICATION DOES NOT CONSTITUTE AN APPROVAL FOR THE ELECTRICAL WIRING OR PLUMBING INSTALLATIONS. A SEPARATE PERMIT FOR THE WIRING AND PLUMBING MUST BE OBTAINED. SEPARATE PERMITS ARE REQUIRED IF ANSWER IS "YES" TO ANY OF ABOVE QUESTIONS (10) (11) (12) (13) (22) OR (24).

THIS IS NOT A BUILDING PERMIT. NO WORK SHALL BE STARTED UNTIL A BUILDING PERMIT IS ISSUED.

In dwellings, all insulating materials must have a clearance of not less than two inches from all electrical wires or equipment.

CHECK APPROPRIATE BOX

☐ OWNER ☐ ARCHITECT
☐ LESSEE ☐ AGENT
☐ CONTRACTOR ☐ ENGINEER

APPLICANT'S CERTIFICATION

I HEREBY CERTIFY AND AGREE THAT IF A PERMIT IS ISSUED FOR THE CONSTRUCTION DESCRIBED IN THIS APPLICATION, ALL THE PROVISIONS OF THE PERMIT AND ALL LAWS AND ORDINANCES THERETO WILL BE COMPLIED WITH.

NOTICE TO APPLICANT

HOLD HARMLESS CLAUSE. The permittee(s) by acceptance of the permit, agree(s) to indemnify and hold harmless the City and County of San Francisco from and against any and all claims, demands and actions for damages resulting from operations under this permit, regardless of negligence of the City and County of San Francisco, and to assume the defense of the City and County of San Francisco against all such claims, demands or actions.

In conformity with the provisions of Section 3800 of the Labor Code of the State of California, the applicant shall have worker's compensation coverage under (I) or (II) designated below, or shall indicate item (III), (IV), or (V), whichever is applicable. If however item (V) is checked, item (IV) must be checked as well. Mark the appropriate method of compliance below.

I hereby affirm under penalty of perjury one of the following declarations:

( ) I. I have and will maintain a certificate of consent to self-insure for worker's compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

(X) II. I have and will maintain worker's compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My worker's compensation insurance carrier and policy number are:
Carrier State Fund
Policy Number 9030168

( ) III. The cost of the work to be done is $100 or less.

( ) IV. I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the worker's compensation laws of California. I further acknowledge that I understand that in the event that I should become subject to the worker's compensation provisions of the Labor Code of California and fail to comply forthwith with the provisions of Section 3800 of the Labor Code, that the permit herein applied for shall be deemed revoked.

( ) V. I certify as the owner (or the agent for the owner) that in the performance of the work for which this permit is issued, I will employ a contractor who complies with the worker's compensation laws of California and who, prior to the commencement of any work, will file a completed copy of this form with the Central Permit Bureau.

Gregory Day 10-16-2015
Signature of Applicant or Agent Date

REV 06/13

OFFICE COPY

NOV 10 2015

OFFICIAL COPY

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

CONDITIONS AND STIPULATIONS

REFER TO:		
	APPROVED: JOSEPH OSPITAL, DBI OCT 16 2015 — BUILDING INSPECTOR, DEPT. OF BLDG. INSP.	DATE: REASON: NOTIFIED MR.
☑	APPROVED: Add 9 interns. on 10/11/15 OMAR MASRY — DEPARTMENT OF CITY PLANNING	DATE: REASON: NOTIFIED MR.
☑	APPROVED: Work in Low Rise 'B' only. Michelle McCoy SFFD OCT 16 2015 — BUREAU OF FIRE PREVENTION & PUBLIC SAFETY	DATE: REASON: NOTIFIED MR.
☐	APPROVED: NA — MECHANICAL ENGINEER, DEPT. OF BLDG. INSPECTION	DATE: REASON: NOTIFIED MR.
☐	APPROVED: CIVIL ENGINEER, DEPT. OF BLDG. INSPECTION	DATE: REASON: NOTIFIED MR.
☐	APPROVED: — BUREAU OF ENGINEERING	DATE: REASON: NOTIFIED MR.
☑	APPROVED: N/A on 10/27/15 — DEPARTMENT OF PUBLIC HEALTH	DATE: REASON: NOTIFIED MR.
☐	APPROVED: NA — REDEVELOPMENT AGENCY	DATE: REASON: NOTIFIED MR.
☐	APPROVED: — HOUSING INSPECTION DIVISION	DATE: REASON: NOTIFIED MR.

HOLD SECTION - NOTE DATES AND NAMES OF ALL PERSONS NOTIFIED DURING PROCESSING

I agree to comply with all conditions or stipulations of the various bureaus or departments noted on this application, and attached statements of conditions or stipulations, which are hereby made a part of this application.

Number of attachments ☐

OWNER'S AUTHORIZED AGENT

OFFICIAL COPY

SAN FRANCISCO
DEPARTMENT OF
BUILDING INSPECTION

ADDRESS OF JOB	BLOCK/LOT	APPLICATION NO.
2500 MARIPOSA ST	3971/001	201510169984

OWNER NAME	TELEPHONE
SFMTA	

ESTIMATED COST	FILE DATE	DISPOSITION	DISPOSITION DATE	PERMIT NO.	EXPIRATION DATE
$20,000	10/16/15	ISSUED	11/10/15	201510169984	11/04/16

FORM	CONST. TYPE	OCCUPANCY CODES	PLANS	STORIES	UNITS	DISTRICT
8	1	H-4,B	2	2	0	8 BID-INSP

CONTACT NAME	TELEPHONE
CHAMPION TELECOM INC	5102268525

DESCRIPTION/BLDG. USE	OTHER DESCRIPTION
AUTO REPAIRS	INSTALL DIS SERVER.INSTALL 1 ELCTRICAL CIRCUIT WITH 4 GANG RECEPT NSTALL ANTENNAS AND CABLES DC AND FI

SPECIAL INSPECTIONS?	NO	FIRE ZONE	NO	
SPECIAL USE DISTRICT		TIDF	NO	
		PENALTY	NO	COMPLIANCE WITH REPORTS

NOTES:

9003-15

PERMIT INSPECTION RECORD
DEPARTMENT OF BUILDING INSPECTION
CITY AND COUNTY OF SAN FRANCISCO
BUILDING INSPECTION JOB CARD

BUILDING INSPECTORS JOB RECORD

DATE	
3/28/16	final ok ms
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/ /	WORK COMPLETED. FINAL CERTIFICATE ISSUED

APP. NO.

BUILDING INSPECTOR

Appendix D-2

San Francisco Planning Department, Historic Resources Evaluation Response, Part 1, 2500 Mariposa Street, September 25, 2020.

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
628.652.7600
www.sfplanning.org

HISTORIC RESOURCE EVALUATION RESPONSE

Record No.:	**2019-021884ENV**
Project Address:	**2500 Mariposa Street**
Zoning:	P – Public Zoning District 65-X Height and Bulk District
Block/Lot:	3971/001
Staff Contact:	Justin Greving - (628) 652-7553 Justin.greving@sfgov.org

PART I: Historic Resource Evaluation

PROJECT SPONSOR SUBMITTAL

To assist in the evaluation of the proposed project, the Project Sponsor has submitted a:

☐ Supplemental Information for Historic Resource Determination Form (HRD)
☒ Consultant-prepared Historic Resource Evaluation (HRE)
Prepared by: VerPlanck Historic Preservation Consulting (dated October 2, 2017)

Staff consensus with Consultant's HRE report: ☒ Agree ☐ Disagree

Additional Comments: Planning Staff concurs with Historic Resource Evaluation provided by VerPlanck Historic Preservation Consulting.

BUILDINGS AND PROPERTY DESCRIPTION

Planning Staff concurs with Historic Resource Evaluation provided by VerPlanck Historic Preservation Consulting According to the Historic Resource Evaluation prepared by VerPlanck Historic Preservation Consulting (dated October 2, 2017) and information found in the Planning Department files, the subject property at 2500 Mariposa St is located on a superblock comprised of two square blocks bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west. The subject lot contains the Potrero Trolley Coach Division Maintenance and Operations Facility, historically known as the Mariposa Bus Yard, including a two-story maintenance and operations building, control tower, surface parking lot, and several work stations located around the perimeter of the yard. The primary building on the lot is a two-story, reinforced-concrete maintenance and operations facility designed in the Renaissance Revival style. The building is roughly divided into two sections, the front portion of the building that faces Mariposa Street is referred to as the office wing, while the rear portion of the building is referred to as the shops wing. The office wing comprises

the primary façade of the building that faces Mariposa Street and is seven bays wide and two stories tall. The ground floor includes wide openings for vehicular entrances and the main pedestrian entry. The upper floor of the building features widely spaced double-hung steel windows with a light pattern of six-over-six. The building is clad in stucco, capped with a flat roof, and is subtly embellished with molded cement plaster ornament including re-entrant corners, Tuscan pilasters and door hoods, a bold intermediate cornice, and a shallow cornice embellished with circular medallions. The office wing wraps the Hampshire Street elevation that features the same decorative detailing as the Mariposa Street façade and is four bays wide with an irregular rhythm of the same double-hung steel windows in addition to a ground floor pedestrian entrance at the corner of Mariposa and Hampshire streets. The office wing connects to the north with the shops wing along Hampshire Street. The shops wing features a prominent parapet wall that is slightly taller than the office wing and is two-stories tall towards Mariposa Street but due to the change in grade is only one story tall as it meets 17th Street to the north. While the office wing is highly ornamented, the shops wing is less so and aside from a small amount of ornamentation consisting of a decorative parapet and sill, the Hampshire Street portion is otherwise a blank stuccoed wall.

The remaining half of the lot is occupied by surface parking lots serving as storage for electric-powered trolley coaches and parking for non-revenue vehicles, with several work stations lining the perimeter of the yard including a coach washing station to the north side, an outdoor maintenance station on the west side, and a fare collection and a defunct vacuum station on the east side. The asphalt paved parking lot is enclosed by 10-foot-high galvanized steel tube fencing with historic piers and gates fronting 17th and Mariposa Streets.

The entire complex was constructed in two phases. In 1915 the original Potrero Car Bar consisted of a one-story, flat-roofed concrete shed with a modest amount of ornament on its exterior. The original car barn faced Mariposa Street and featured 7 bays for streetcars accessed from a single spur line off Mariposa Street, with additional streetcar storage located on the roof and accessed from a track running off of 17th Street. In 1924 a second story was added to the building, the office wing was added directly on top of the original 7 bays along Mariposa Street while behind this office wing a maintenance wing that was two bays wide was constructed on top of the existing roof along Hampshire Street. The facility was Muni's second purpose-built streetcar barn and the first such facility constructed south of Market Street. It was built to provide maintenance and storage facilities for Muni's streetcar lines operating south of Market Street. Due to falling ridership and rising expenses associated with streetcar operations by the 1940s, the Public Utilities Commission decided to replace nearly all of its streetcar lines with bus or trolley coach service. As part of this effort, the Potrero Car Barn was converted into an electric trolley coach maintenance and operations facility in 1948-1949.

Known exterior alterations include: addition of a second floor (1924), conversion from car barn into a trolley coach maintenance facility, which included remodeling the west and north facades and the removal of the rear portion of two former streetcar maintenance shops on the second floor level (1948-49), seismic retrofit/rehabilitation, which included changes to the west façade and the main entrance on Mariposa Street (1989-90), remodel of the existing fare collection shop and the electronic repair shop (1995), reroofing (1999), and installation of an electrical circuit and telecommunication equipment (2015).

PRE-EXISTING HISTORIC RATING / SURVEY

☒ Category A – Known Historic Resource, per: Showplace Square/Northeast Mission Historic Resources Survey surveyed the subject property and gave it a rating of 3CS (individually eligible for listing in the California Register). Although this property had been previously surveyed and identified as a historic resource, the HRE prepared by VerPlanck Historic Preservation

Consultants provided additional information about the building history and put it in the context of San Francisco transportation history.

☐ Category B – Age Eligible/Historic Status Unknown

☐ Category C – Not Age Eligible / No Historic Resource Present, per: _____

Adjacent or Nearby Historic Resources: ☒ Yes ☐ No There are two identified historic resources across the street from the subject building: 2401 17th Street (3973/001), 2450 17th Street (3962/014) (individual resources identified in the Showplace Square/Northeast Mission Historic Resources Survey)

CEQA HISTORICAL RESOURCE(S) EVALUATION

Step A: Significance

Individual Significance	
Property is individually eligible for inclusion in a California Register under one or more of the following Criteria: **Criterion 1** - Event: ☒ Yes ☐ No **Criterion 2** - Persons: ☐ Yes ☒ No **Criterion 3** - Architecture: ☒ Yes ☐ No **Criterion 4** - Info. Potential: ☐ Yes ☒ No Period of Significance: 1915-1948	Property is eligible for inclusion in a California Register Historic District/Context under one or more of the following Criteria: **Criterion 1** - Event: ☐ Yes ☒ No **Criterion 2** - Persons: ☐ Yes ☒ No **Criterion 3** - Architecture: ☐ Yes ☒ No **Criterion 4** - Info. Potential: ☐ Yes ☒ No Period of Significance: _____ ☐ Contributor ☐ Non-Contributor ☒ N/A

Analysis:
The subject property at 2500 Mariposa Street is eligible for listing in the California Register under Criterion 1 as a facility dating back to the earliest years of San Francisco's Municipal Railway, America's first publicly owned street railway, with a period of significance from 1915 to 1948 (year of conversion into an electric trolley coach maintenance and operations facility). The Potrero Car Barn, as the facility was first known, was Muni's second purpose-built car barn and the first such facility built south of Market Street. The subject property is also eligible under Criterion 3 as a property that embodies the characteristics of a car barn, post-quake reconstruction, as well as being the work of a master, Michael M. O'Shaughnessy, known as the most influential and important Chief Engineer to ever hold this position. The period of significance under Criterion 3 is 1924 to 1941. The Potrero Car Barn along with the Geary Car Barn were built of reinforced concrete and designed in the Renaissance Revival style, much different from their predecessors in style and materials. Today, there are very few pre-World War II car barns remaining in San Francisco.

Step B: Integrity

Location:	☒ Retains	☐ Lacks	**Setting:**	☐ Retains	☒ Lacks
Association:	☒ Retains	☐ Lacks	**Feeling:**	☒ Retains	☐ Lacks
Design:	☒ Retains	☐ Lacks	**Materials:**	☒ Retains	☐ Lacks
Workmanship:	☒ Retains	☐ Lacks			

Analysis:
Planning Department staff agree with the findings of the HRE that the property retains six out of seven aspects of integrity. The subject property has seen several alterations since it was completed in 1924, the most substantial of which occurred in 1948-1949 when Muni converted the building from a car barn into a trolley coach facility; alterations to the site included removal of the rear portion of two-street car maintenance shops on the second floor level, remodeling the west façade, construction of a control room at 17th and Hampshire streets, alterations to the bays along Mariposa Street, and removal of all streetcar tracks from the site. The subject property was further remodeled in 1989-1990 as part of a seismic upgrade of the facility that included interior alterations, further modifications to the west elevation, and alterations to the Mariposa Street elevation. Despite these alterations the subject property is still recognizable as an early twentieth century car bar, in particular from the corner of Mariposa and Hampshire Streets, and therefore retains sufficient integrity as an individual resource eligible for listing in the CRHR under Criterion 1 and 3.

Step C: Character Defining Features

The character-defining features of the subject property include the following:

The character-defining features of the subject property include the following:

- Overall height and massing of the two-story office wing and the remaining portions of the original shops wing along Hampshire Street, including its flat roof;
- Fenestration pattern on office wing (Mariposa and Hampshire Streets only) consisting of large
- vehicular openings at the first floor and groups of three double-hung metal windows at the second floor level;
- Remaining molded concrete and cement plaster ornament on Mariposa and Hampshire Streets,
- including re-entrant corner detailing, pilasters separating the vehicular openings, molded intermediate cornice, continuous lug sill beneath the windows, shallow cornice, and medallion featuring original Muni logo. Some of this detailing continues along the west and east (Hampshire Street) façades of the office wing, as well as on the shops wing on Hampshire Street;
- Remaining pedestrian door surround on Hampshire Street façade with inscription above;
- Remaining door trim on westernmost vehicular bay on Mariposa Street;
- Surviving double-hung, six-over-six, metal windows on office wing;
- Flagpole.

CEQA HISTORIC RESOURCE DETERMINATION

☒ Individually-eligible Historical Resource Present
☐ Contributor to an eligible Historical District / Contextual Resource Present
☐ Non-contributor to an eligible Historic District / Context / Cultural District
☐ No Historical Resource Present

NEXT STEPS

☒ HRER Part II Review Required
☐ Categorically Exempt, consult:
☐ Historic Design Review
☐ Design Advisory Team
☐ Current Planner

PART I: Principal Preservation Planner Review

Signature: Allison Vanderslice Date: 9/25/2020

Allison Vanderslice, *Principal Preservation Planner*
CEQA Cultural Resources Team Manager, Environmental Planning Division

CC: Laura Lynch, *Senior Environmental Planner*

Figure 1: SFMTA Potrero Trolley Coach Division Facility, view northeast of west elevation (left) and south elevation (right, primary façade that faces Mariposa Street), (photo courtesy of HRE Part 1). The two story office wing is visible from this vantage point.

Figure 2: SFMTA Potrero Trolley Coach Division Facility, view northwest of east elevation facing Hampshire Street, (photo courtesy of HRE Part 1). The two story office wing connection is visible where the two parapet walls meet.

Figure 3: SFMTA Potrero Trolley Coach Division Facility, view northwest of east elevation facing Hampshire Street, (photo courtesy of HRE Part 1). The end of the shops wing is visible here along Hampshire Street at the intersection of Hampshire and 17th Street.

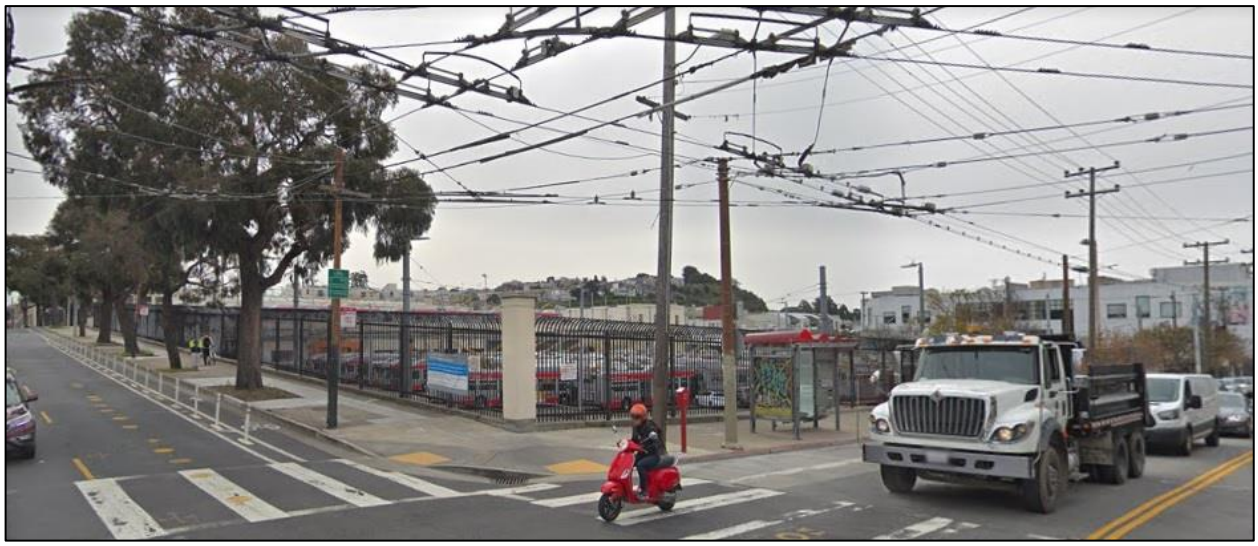


Figure 3: SFMTA Potrero Trolley Coach Division Facility, bus parking lot that occupies the western half of the site, view southeast at the corner of Bryant and 17th streets, (photo courtesy of Google maps). The surface parking lot that takes up the western portion of the site is visible from this vantage point.

Appendix D-3

San Francisco Planning Department, Historic Resources Evaluation Response, Part 2, 2500 Mariposa Street, September 25, 2020.

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
628.652.7600
www.sfplanning.org

HISTORIC RESOURCE EVALUATION RESPONSE

Record No.:	**2019-021884ENV**
Project Address:	**2500 Mariposa Street**
Zoning:	P – Public Zoning District 65-X Height and Bulk District
Block/Lot:	3971/001
Staff Contact:	Justin Greving - (628) 652-7553 Justin.greving@sfgov.org

Part II: Project Evaluation

Proposed Project:		Per Drawings Dated:
☒ **Demolition / New Construction**	☐ **Alteration**	11/20/2019

PROJECT DESCRIPTION

The proposed project includes demolition of the existing Potrero Yard Muni Bus Maintenance Facility (Potrero Yard), for the construction of a new bus facility and residential development with a total of approximately 600,000 to 650,000 square feet dedicated to the public transit facility on the lower levels and approximately 525 to 575 units above.

PROJECT DETERMINATION

Based on the Historic Resource Evaluation in Part I, the project's scope of work:

☒ Will cause a significant adverse impact to the individual historic resource as proposed.
☐ Will cause a significant adverse impact to a historic district / context as proposed.

☐ Will not cause a significant adverse impact to the individual historic resource as proposed.
☐ Will not cause a significant adverse impact to a historic district / context as proposed.

PROJECT IMPACT ANALYSIS

Because the proposed project includes demolition of the Potrero Yard, all character-defining features of the historic resource will be removed. Although the use on the site will remain a transit facility, demolition of the building and construction of a new transit facility means that the site will no longer convey its significance as the second purpose-built car barn in San Francisco that originally served electric trolleys, nor will it convey its significance as the work of master architect Michael M. O'Shaughnessy. The demolition and new construction of

Potrero Yard will remove historic materials, features, and spaces that characterize the property and would result in physical destruction, damage or alteration such that the significance of the individual historical resource would be materially impaired. Therefore, staff find the proposed project would result in a significant unavoidable impact to the Potrero Yard Muni Bus Maintenance Facility at 2500 Mariposa Street.

MITIGATION MEASURES

Because it is determined that the proposed project will cause a significant unavoidable impact to Potrero Yard, the Department requires the following Mitigation Measures to reduce impacts to the historic resource. Although these measures may reduce impacts to historic resources through the documentation of the affected property and presentation of the findings to the community, they will not reduce the impact to a less-than-significant-level. Only avoidance of substantial adverse changes would reduce impacts to less-than-significant levels. Although the following mitigation measures have been identified they may be amended and additional measures may be required as the project develops.

Mitigation Measure 1: Documentation of Historical Resource(s)
Mitigation Measure 2: Salvage Plan
Mitigation Measure 3: Video Recordation
Mitigation Measure 4: Interpretative Program
Mitigation Measure 5: Oral Histories

PART II: Principal Preservation Planner Review

Signature: Allison Vanderslice Date: 9/25/2020

Allison Vanderslice, *Principal Preservation Planner*
CEQA Cultural Resources Team Manager, Environmental Planning Division

CC: Laura Lynch, Senior Environmental Planner

APPENDIX E

Transportation and Circulation Calculations Details and Supporting Information

Appendix E-1: Summary of Intersection Turning Movement Volumes

Appendix E-2: Vehicle, Bicycle, and Pedestrian Counts

Appendix E-3: Loading and Parking Data

Appendix E-4: Travel Demand Memorandum

Appendix E-5: Travel Demand for Project Alternatives

Appendix E-1

Summary of Intersection Turning Movement Volumes

SFMTA Potrero Yard Modernization Project EIR

Weekday A.M. and P.M. Peak Hour Intersection Turning Movement Volumes

Existing Conditions													
Intersection	**Eastbound**			**Westbound**			**Northbound**			**Southbound**			**Total**
	L	T	R	L	T	R	L	T	R	L	T	R	
1. Bryant St/16th St													
a.m.	17	444	26	15	525	154	36	328	57	27	93	55	1,777
p.m.	13	435	42	32	847	149	36	327	78	57	206	66	2,288
2. Bryant St/17th St													
a.m.	50	241	22	35	254	60	17	341	26	18	118	16	1,198
p.m.	52	195	25	27	250	87	8	281	29	50	252	16	1,272
3. Bryant St/Mariposa St													
a.m.	29	63	33	16	61	21	25	333	22	16	146	17	782
p.m.	16	74	23	37	100	48	15	253	20	22	268	11	887
4. Hampshire St/17th St													
a.m.	6	264	18	26	341	5	11	0	32	2	1	2	708
p.m.	4	260	13	39	348	0	17	1	24	3	8	7	724
5. Hampshire St/Mariposa St													
a.m.	13	68	10	20	93	8	14	33	24	4	18	13	318
p.m.	11	84	20	24	131	10	15	18	16	11	39	17	396
6. York St/Mariposa St													
a.m.	2	74	22	25	87	6	7	0	16	0	0	0	239
p.m.	3	99	11	6	154	2	26	0	13	0	0	0	314
7. Potrero Ave/16th St													
a.m.	4	325	100	4	421	37	148	648	73	147	469	116	2,492
p.m.	5	355	203	5	689	48	148	489	80	119	656	153	2,950

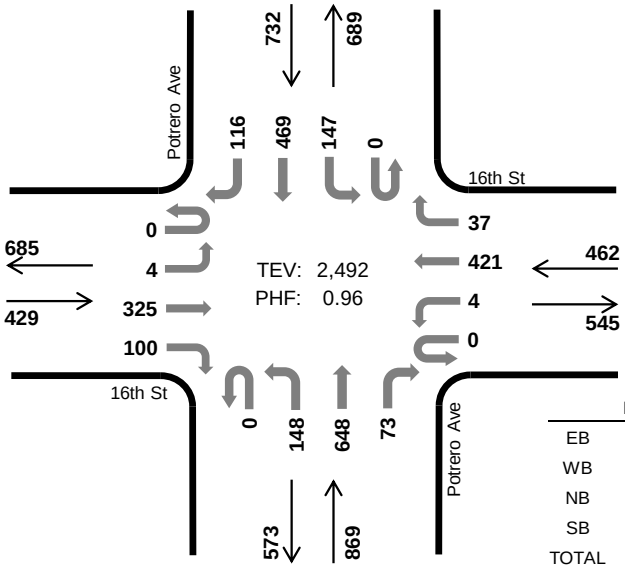
Appendix E-2

Vehicle, Bicycle, and Pedestrian Counts

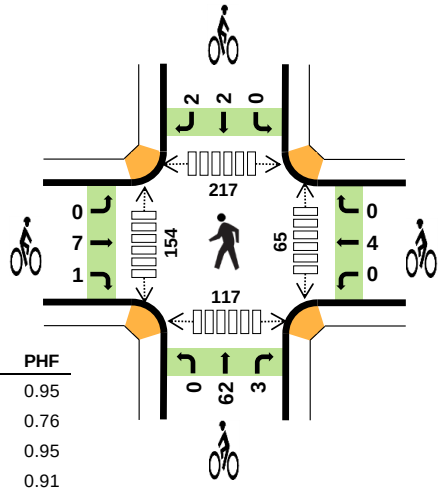
Potrero Ave
16th St

Peak Hour

Date: 02-19-2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	8.9%	0.95
WB	8.7%	0.76
NB	7.0%	0.95
SB	6.1%	0.91
TOTAL	7.4%	0.96



Two-Hour Count Summaries

Interval Start		16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	62	26	0	2	103	5	0	34	85	8	0	30	88	16	459	0
7:15 AM		0	0	74	16	0	3	111	6	0	39	112	6	0	50	96	19	532	0
7:30 AM		0	1	66	29	0	1	102	18	0	48	150	16	0	48	105	33	617	0
7:45 AM		**0**	**4**	**80**	**29**	**0**	**3**	**132**	**16**	**0**	**32**	**155**	**12**	**0**	**37**	**113**	**27**	**640**	2,248
8:00 AM		**0**	**0**	**84**	**26**	**0**	**1**	**107**	**8**	**0**	**42**	**175**	**11**	**0**	**47**	**111**	**34**	**646**	2,435
8:15 AM		**0**	**0**	**87**	**22**	**0**	**0**	**87**	**5**	**0**	**43**	**156**	**23**	**0**	**42**	**95**	**24**	**584**	2,487
8:30 AM		**0**	**0**	**74**	**23**	**0**	**0**	**95**	**8**	**0**	**31**	**162**	**27**	**0**	**21**	**150**	**31**	**622**	**2,492**
8:45 AM		0	0	77	12	0	1	88	7	0	45	163	32	0	1	155	28	609	2,461
Count Total		0	5	604	183	0	11	825	73	0	314	1,158	135	0	276	913	212	4,709	0
Peak Hour	**All**	**0**	**4**	**325**	**100**	**0**	**4**	**421**	**37**	**0**	**148**	**648**	**73**	**0**	**147**	**469**	**116**	**2,492**	**0**
	HV	**0**	**0**	**30**	**8**	**0**	**1**	**37**	**2**	**0**	**15**	**40**	**6**	**0**	**7**	**34**	**4**	**184**	**0**
	HV%	**-**	**0%**	**9%**	**8%**	**-**	**25%**	**9%**	**5%**	**-**	**10%**	**6%**	**8%**	**-**	**5%**	**7%**	**3%**	**7%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	13	14	20	3	*50*	1	0	0	1	*2*	12	29	29	16	*86*
7:15 AM	12	13	12	7	*44*	2	2	1	2	*7*	18	48	55	29	*150*
7:30 AM	13	11	14	6	*44*	2	0	11	4	*17*	12	39	31	24	*106*
7:45 AM	**8**	**12**	**14**	**9**	***43***	**3**	**2**	**11**	**0**	***16***	**6**	**32**	**47**	**22**	*107*
8:00 AM	**14**	**9**	**14**	**6**	***43***	**3**	**0**	**13**	**2**	***18***	**19**	**27**	**53**	**25**	*124*
8:15 AM	**8**	**10**	**14**	**11**	***43***	**2**	**1**	**17**	**0**	***20***	**22**	**54**	**69**	**40**	*185*
8:30 AM	**8**	**9**	**19**	**19**	***55***	**0**	**1**	**24**	**2**	***27***	**18**	**41**	**48**	**30**	***137***
8:45 AM	11	9	13	9	*42*	4	1	26	2	*33*	24	39	61	33	*157*
Count Total	87	87	120	70	*364*	17	7	103	13	*140*	131	309	393	219	*1,052*
Peak Hour	**38**	**40**	**61**	**45**	***184***	**8**	**4**	**65**	**4**	***81***	**65**	**154**	**217**	**117**	***553***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	8	5	0	1	13	0	0	5	13	2	0	0	3	0	50	0
7:15 AM	0	0	8	4	0	1	12	0	0	4	7	1	0	1	6	0	44	0
7:30 AM	0	0	8	5	0	1	10	0	0	3	10	1	0	1	5	0	44	0
7:45 AM	**0**	**0**	**7**	**1**	**0**	**1**	**10**	**1**	**0**	**6**	**7**	**1**	**0**	**1**	**8**	**0**	**43**	181
8:00 AM	**0**	**0**	**11**	**3**	**0**	**0**	**8**	**1**	**0**	**3**	**9**	**2**	**0**	**2**	**4**	**0**	**43**	174
8:15 AM	**0**	**0**	**6**	**2**	**0**	**0**	**10**	**0**	**0**	**3**	**10**	**1**	**0**	**3**	**8**	**0**	**43**	173
8:30 AM	**0**	**0**	**6**	**2**	**0**	**0**	**9**	**0**	**0**	**3**	**14**	**2**	**0**	**1**	**14**	**4**	**55**	**184**
8:45 AM	0	0	9	2	0	1	8	0	0	5	8	0	0	0	9	0	42	183
Count Total	0	0	63	24	0	5	80	2	0	32	78	10	0	9	57	4	364	0
Peak Hour	**0**	**0**	**30**	**8**	**0**	**1**	**37**	**2**	**0**	**15**	**40**	**6**	**0**	**7**	**34**	**4**	**184**	**0**

Two-Hour Count Summaries - Bikes

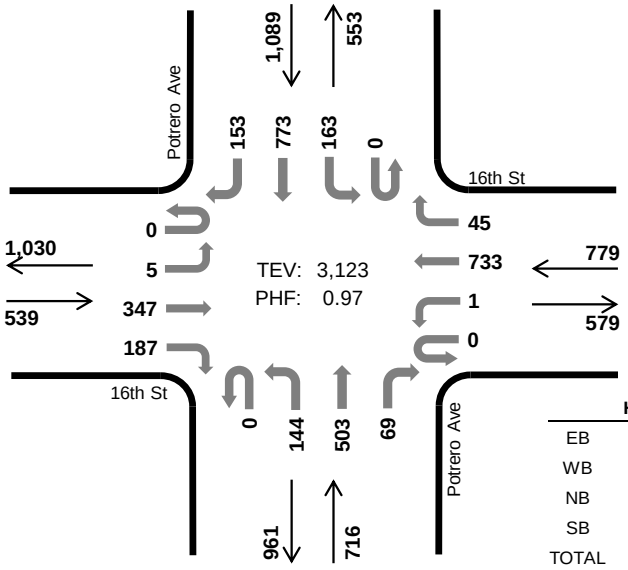
Interval Start	16th St Eastbound			16th St Westbound			Potrero Ave Northbound			Potrero Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	0	0	0	0	1	0	2	0
7:15 AM	0	2	0	0	2	0	0	1	0	0	2	0	7	0
7:30 AM	0	2	0	0	0	0	0	11	0	0	4	0	17	0
7:45 AM	**0**	**3**	**0**	**0**	**2**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**16**	42
8:00 AM	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**12**	**1**	**0**	**1**	**1**	**18**	58
8:15 AM	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**16**	**1**	**0**	**0**	**0**	**20**	71
8:30 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**23**	**1**	**0**	**1**	**1**	**27**	**81**
8:45 AM	0	4	0	0	1	0	0	25	1	0	1	1	33	98
Count Total	0	15	2	0	7	0	0	99	4	0	10	3	140	0
Peak Hour	**0**	**7**	**1**	**0**	**4**	**0**	**0**	**62**	**3**	**0**	**2**	**2**	**81**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

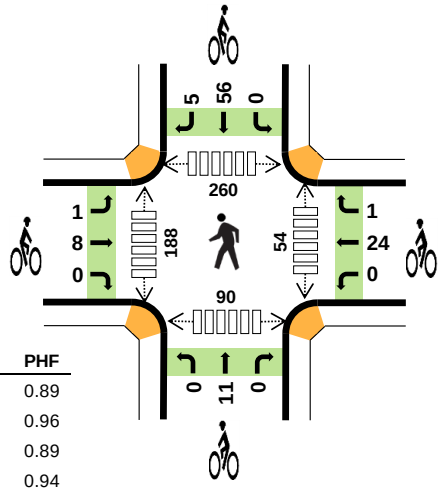
Potrero Ave
16th St

Peak Hour

Date: 02-20-2020
Count Period: 5:00 PM to 8:00 PM
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	8.9%	0.89
WB	4.7%	0.96
NB	4.2%	0.89
SB	4.3%	0.94
TOTAL	5.2%	0.97



Three-Hour Count Summaries

Interval Start		16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
5:00 PM		0	3	85	41	0	0	164	16	0	41	149	12	0	38	221	31	801	0
5:15 PM		0	0	90	49	0	0	189	9	0	35	113	18	0	43	196	47	789	0
5:30 PM		0	2	95	54	0	0	188	11	0	24	146	23	0	38	182	46	809	0
5:45 PM		0	0	77	43	0	1	192	9	0	44	95	16	0	44	174	29	724	3,123
Peak Hour	All	0	5	347	187	0	1	733	45	0	144	503	69	0	163	773	153	3,123	0
	HV	0	0	40	8	0	1	36	0	0	8	20	2	0	4	42	1	162	0
	HV%	-	0%	12%	4%	-	100%	5%	0%	-	6%	4%	3%	-	2%	5%	1%	5%	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
5:00 PM	10	9	7	8	*34*	3	6	1	18	*28*	14	47	64	26	*151*
5:15 PM	9	10	11	21	*51*	0	9	2	14	*25*	15	54	74	20	*163*
5:30 PM	16	8	6	13	*43*	5	5	2	16	*28*	15	48	65	28	*156*
5:45 PM	13	10	6	5	*34*	1	5	6	13	*25*	10	39	57	16	*122*
Peak Hour	48	37	30	47	*162*	9	25	11	61	*106*	54	188	260	90	*592*

Three-Hour Count Summaries

Interval Start	16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
5:00 PM	**0**	**3**	**85**	**41**	**0**	**0**	**164**	**16**	**0**	**41**	**149**	**12**	**0**	**38**	**221**	**31**	**801**	0
5:15 PM	**0**	**0**	**90**	**49**	**0**	**0**	**189**	**9**	**0**	**35**	**113**	**18**	**0**	**43**	**196**	**47**	**789**	0
5:30 PM	**0**	**2**	**95**	**54**	**0**	**0**	**188**	**11**	**0**	**24**	**146**	**23**	**0**	**38**	**182**	**46**	**809**	0
5:45 PM	**0**	**0**	**77**	**43**	**0**	**1**	**192**	**9**	**0**	**44**	**95**	**16**	**0**	**44**	**174**	**29**	**724**	**3,123**
6:00 PM	0	1	92	47	0	2	168	20	0	25	99	17	0	51	166	32	720	3,042
6:15 PM	0	0	101	46	0	1	168	15	0	29	87	14	0	57	161	33	712	2,965
6:30 PM	0	0	77	51	0	2	162	5	0	31	85	9	0	54	175	29	680	2,836
6:45 PM	0	1	78	37	0	1	166	8	0	35	95	11	0	49	130	32	643	2,755
7:00 PM	0	0	77	50	0	2	168	10	0	28	87	18	0	37	124	32	633	2,668
7:15 PM	0	2	79	32	0	3	155	18	0	20	77	16	0	31	119	24	576	2,532
7:30 PM	0	1	71	35	0	4	140	13	0	19	79	9	0	50	109	27	557	2,409
7:45 PM	0	2	65	34	0	1	130	9	0	25	70	7	0	16	105	28	492	2,258
Count Total	0	12	987	519	0	17	1,990	143	0	356	1,182	170	0	508	1,862	390	8,136	0
Peak Hour All	**0**	**5**	**347**	**187**	**0**	**1**	**733**	**45**	**0**	**144**	**503**	**69**	**0**	**163**	**773**	**153**	**3,123**	**0**
Peak Hour HV	**0**	**0**	**40**	**8**	**0**	**1**	**36**	**0**	**0**	**8**	**20**	**2**	**0**	**4**	**42**	**1**	**162**	**0**
Peak Hour HV%	**-**	**0%**	**12%**	**4%**	**-**	**100%**	**5%**	**0%**	**-**	**6%**	**4%**	**3%**	**-**	**2%**	**5%**	**1%**	**5%**	**0**

Note: Three-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
5:00 PM	**10**	**9**	**7**	**8**	***34***	**3**	**6**	**1**	**18**	***28***	**14**	**47**	**64**	**26**	*151*
5:15 PM	**9**	**10**	**11**	**21**	***51***	**0**	**9**	**2**	**14**	***25***	**15**	**54**	**74**	**20**	*163*
5:30 PM	**16**	**8**	**6**	**13**	***43***	**5**	**5**	**2**	**16**	***28***	**15**	**48**	**65**	**28**	*156*
5:45 PM	**13**	**10**	**6**	**5**	***34***	**1**	**5**	**6**	**13**	***25***	**10**	**39**	**57**	**16**	***122***
6:00 PM	14	8	7	13	*42*	1	8	2	11	*22*	15	52	62	22	*151*
6:15 PM	13	15	12	10	*50*	1	5	5	10	*21*	14	45	46	24	*129*
6:30 PM	14	14	8	12	*48*	3	5	5	7	*20*	10	39	54	15	*118*
6:45 PM	14	13	9	11	*47*	3	4	4	5	*16*	10	27	42	12	*91*
7:00 PM	12	7	7	15	*41*	2	3	0	6	*11*	10	36	31	14	*91*
7:15 PM	11	12	7	5	*35*	4	6	2	6	*18*	7	20	25	16	*68*
7:30 PM	16	6	10	9	*41*	3	6	1	10	*20*	9	30	28	7	*74*
7:45 PM	10	5	2	9	*26*	0	0	7	5	*12*	12	20	25	11	*68*
Count Total	152	117	92	131	*492*	26	62	37	121	*246*	141	457	573	211	*1,382*
Peak Hour	**48**	**37**	**30**	**47**	***162***	**9**	**25**	**11**	**61**	***106***	**54**	**188**	**260**	**90**	***592***

Three-Hour Count Summaries - Heavy Vehicles

Interval Start	16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
5:00 PM	**0**	**0**	**8**	**2**	**0**	**0**	**9**	**0**	**0**	**4**	**3**	**0**	**0**	**0**	**8**	**0**	**34**	0
5:15 PM	**0**	**0**	**8**	**1**	**0**	**0**	**10**	**0**	**0**	**2**	**7**	**2**	**0**	**0**	**21**	**0**	**51**	0
5:30 PM	**0**	**0**	**13**	**3**	**0**	**0**	**8**	**0**	**0**	**2**	**4**	**0**	**0**	**2**	**11**	**0**	**43**	0
5:45 PM	**0**	**0**	**11**	**2**	**0**	**1**	**9**	**0**	**0**	**0**	**6**	**0**	**0**	**2**	**2**	**1**	**34**	**162**
6:00 PM	0	0	12	2	0	0	8	0	0	2	4	1	0	6	7	0	42	170
6:15 PM	0	0	11	2	0	1	14	0	0	6	5	1	0	1	9	0	50	169
6:30 PM	0	0	12	2	0	2	12	0	0	3	5	0	0	2	10	0	48	174
6:45 PM	0	0	11	3	0	1	12	0	0	4	3	2	0	4	7	0	47	187
7:00 PM	0	0	9	3	0	1	6	0	0	3	3	1	0	0	15	0	41	186
7:15 PM	0	0	7	4	0	0	12	0	0	3	3	1	0	0	5	0	35	171
7:30 PM	0	0	16	0	0	2	4	0	0	6	3	1	0	4	5	0	41	164
7:45 PM	0	0	8	2	0	1	3	1	0	1	1	0	0	0	9	0	26	143
Count Total	0	0	126	26	0	9	107	1	0	36	47	9	0	21	109	1	492	0
Peak Hour	**0**	**0**	**40**	**8**	**0**	**1**	**36**	**0**	**0**	**8**	**20**	**2**	**0**	**4**	**42**	**1**	**162**	**0**

Three-Hour Count Summaries - Bikes

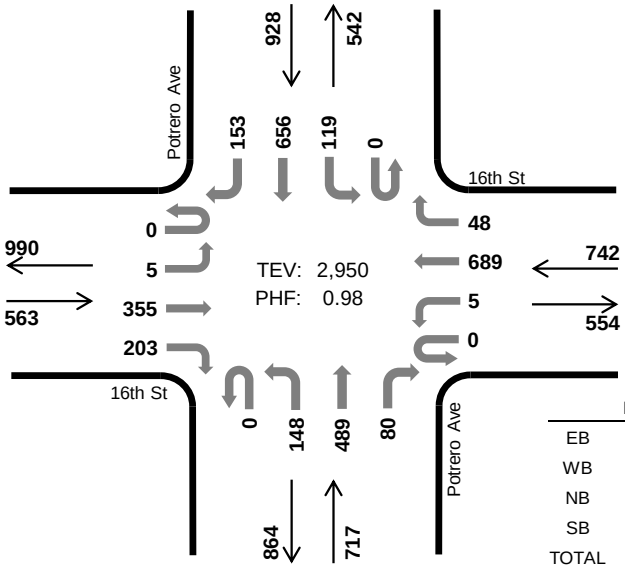
Interval Start	16th St Eastbound			16th St Westbound			Potrero Ave Northbound			Potrero Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
5:00 PM	**0**	**3**	**0**	**0**	**5**	**1**	**0**	**1**	**0**	**0**	**18**	**0**	**28**	0
5:15 PM	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**2**	**0**	**0**	**12**	**2**	**25**	0
5:30 PM	**1**	**4**	**0**	**0**	**5**	**0**	**0**	**2**	**0**	**0**	**15**	**1**	**28**	0
5:45 PM	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**6**	**0**	**0**	**11**	**2**	**25**	**106**
6:00 PM	0	1	0	0	8	0	0	2	0	0	9	2	22	100
6:15 PM	0	1	0	0	5	0	0	5	0	0	9	1	21	96
6:30 PM	0	2	1	0	5	0	0	5	0	0	4	3	20	88
6:45 PM	0	2	1	0	4	0	1	3	0	0	3	2	16	79
7:00 PM	0	2	0	0	3	0	0	0	0	0	6	0	11	68
7:15 PM	0	2	2	0	6	0	0	2	0	0	4	2	18	65
7:30 PM	0	3	0	1	5	0	0	1	0	0	9	1	20	65
7:45 PM	0	0	0	0	0	0	0	6	1	0	5	0	12	61
Count Total	1	21	4	1	60	1	1	35	1	0	105	16	246	0
Peak Hour	**1**	**8**	**0**	**0**	**24**	**1**	**0**	**11**	**0**	**0**	**56**	**5**	**106**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

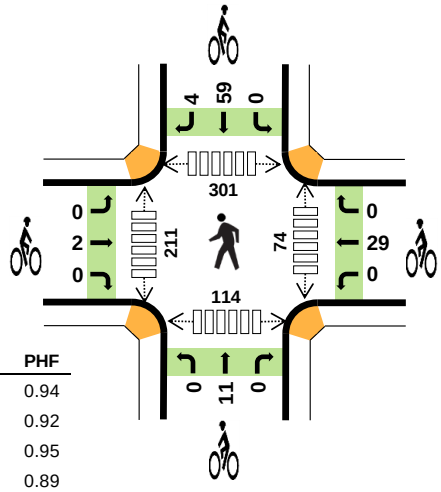
Potrero Ave
16th St

Date: 02-19-2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour



	HV %:	PHF
EB	7.6%	0.94
WB	4.9%	0.92
NB	5.0%	0.95
SB	4.0%	0.89
TOTAL	5.2%	0.98



Two-Hour Count Summaries

Interval Start		16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	1	86	40	0	1	128	17	0	49	149	18	0	25	139	38	691	0
4:15 PM		0	2	53	53	0	0	133	9	0	34	142	16	0	37	156	32	667	0
4:30 PM		0	1	69	49	0	0	165	13	0	43	120	24	0	17	176	37	714	0
4:45 PM		0	1	82	46	0	1	175	19	0	39	89	8	0	29	170	31	690	2,762
5:00 PM		**0**	**0**	**73**	**61**	**0**	**1**	**189**	**12**	**0**	**42**	**129**	**11**	**0**	**17**	**162**	**41**	**738**	2,809
5:15 PM		**0**	**2**	**98**	**50**	**0**	**2**	**169**	**10**	**0**	**28**	**108**	**21**	**0**	**35**	**187**	**40**	**750**	2,892
5:30 PM		**0**	**2**	**94**	**42**	**0**	**0**	**185**	**10**	**0**	**42**	**126**	**21**	**0**	**30**	**159**	**40**	**751**	2,929
5:45 PM		**0**	**1**	**90**	**50**	**0**	**2**	**146**	**16**	**0**	**36**	**126**	**27**	**0**	**37**	**148**	**32**	**711**	**2,950**
Count Total		0	10	645	391	0	7	1,290	106	0	313	989	146	0	227	1,297	291	5,712	0
Peak Hour	**All**	**0**	**5**	**355**	**203**	**0**	**5**	**689**	**48**	**0**	**148**	**489**	**80**	**0**	**119**	**656**	**153**	**2,950**	**0**
	HV	**0**	**0**	**33**	**10**	**0**	**3**	**32**	**1**	**0**	**10**	**24**	**2**	**0**	**5**	**32**	**0**	**152**	**0**
	HV%	**-**	**0%**	**9%**	**5%**	**-**	**60%**	**5%**	**2%**	**-**	**7%**	**5%**	**3%**	**-**	**4%**	**5%**	**0%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	12	8	10	7	*37*	0	8	2	5	*15*	18	65	68	15	*166*
4:15 PM	9	9	12	10	*40*	4	3	2	5	*14*	17	42	46	17	*122*
4:30 PM	11	9	12	6	*38*	2	4	2	6	*14*	13	62	63	12	*150*
4:45 PM	11	12	3	10	*36*	1	2	3	10	*16*	16	63	55	22	*156*
5:00 PM	**11**	**9**	**14**	**4**	***38***	**2**	**9**	**3**	**16**	***30***	**22**	**47**	**84**	**30**	*183*
5:15 PM	**8**	**7**	**6**	**16**	***37***	**0**	**5**	**4**	**18**	***27***	**15**	**67**	**81**	**29**	*192*
5:30 PM	**10**	**12**	**10**	**12**	***44***	**0**	**12**	**2**	**10**	***24***	**16**	**53**	**69**	**31**	*169*
5:45 PM	**14**	**8**	**6**	**5**	***33***	**0**	**3**	**2**	**19**	***24***	**21**	**44**	**67**	**24**	***156***
Count Total	86	74	73	70	*303*	9	46	20	89	*164*	138	443	533	180	*1,294*
Peak Hour	**43**	**36**	**36**	**37**	***152***	**2**	**29**	**11**	**63**	***105***	**74**	**211**	**301**	**114**	***700***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	16th St Eastbound				16th St Westbound				Potrero Ave Northbound				Potrero Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	10	2	0	0	8	0	0	2	7	1	0	2	4	1	37	0
4:15 PM	0	0	6	3	0	0	9	0	0	2	8	2	0	1	9	0	40	0
4:30 PM	0	0	9	2	0	0	9	0	0	3	8	1	0	2	4	0	38	0
4:45 PM	0	1	8	2	0	1	10	1	0	1	1	1	0	0	10	0	36	151
5:00 PM	**0**	**0**	**8**	**3**	**0**	**1**	**7**	**1**	**0**	**5**	**9**	**0**	**0**	**0**	**4**	**0**	**38**	152
5:15 PM	**0**	**0**	**6**	**2**	**0**	**0**	**7**	**0**	**0**	**2**	**4**	**0**	**0**	**1**	**15**	**0**	**37**	149
5:30 PM	**0**	**0**	**8**	**2**	**0**	**0**	**12**	**0**	**0**	**2**	**6**	**2**	**0**	**2**	**10**	**0**	**44**	155
5:45 PM	**0**	**0**	**11**	**3**	**0**	**2**	**6**	**0**	**0**	**1**	**5**	**0**	**0**	**2**	**3**	**0**	**33**	**152**
Count Total	0	1	66	19	0	4	68	2	0	18	48	7	0	10	59	1	303	0
Peak Hour	**0**	**0**	**33**	**10**	**0**	**3**	**32**	**1**	**0**	**10**	**24**	**2**	**0**	**5**	**32**	**0**	**152**	**0**

Two-Hour Count Summaries - Bikes

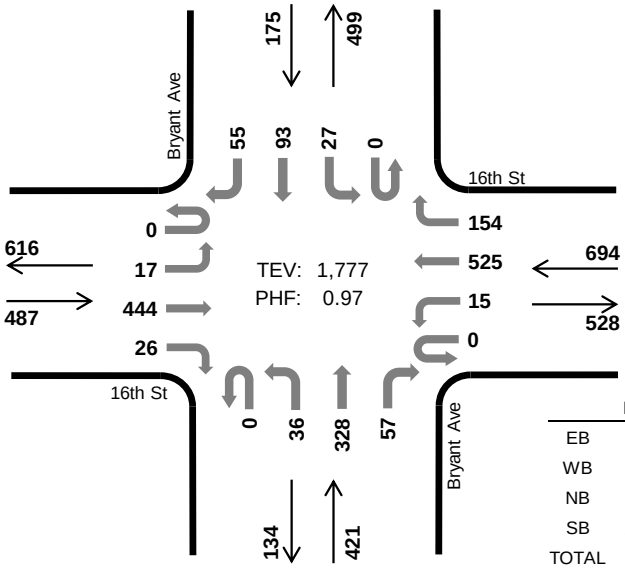
Interval Start	16th St Eastbound			16th St Westbound			Potrero Ave Northbound			Potrero Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	1	5	2	0	1	1	0	3	2	15	0
4:15 PM	0	3	1	0	3	0	0	2	0	0	4	1	14	0
4:30 PM	1	1	0	0	4	0	0	2	0	0	3	3	14	0
4:45 PM	0	1	0	0	2	0	0	2	1	0	7	3	16	59
5:00 PM	**0**	**2**	**0**	**0**	**9**	**0**	**0**	**3**	**0**	**0**	**15**	**1**	**30**	74
5:15 PM	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**4**	**0**	**0**	**18**	**0**	**27**	87
5:30 PM	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**2**	**0**	**0**	**10**	**0**	**24**	97
5:45 PM	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**2**	**0**	**0**	**16**	**3**	**24**	**105**
Count Total	1	7	1	1	43	2	0	18	2	0	76	13	164	0
Peak Hour	**0**	**2**	**0**	**0**	**29**	**0**	**0**	**11**	**0**	**0**	**59**	**4**	**105**	**0**

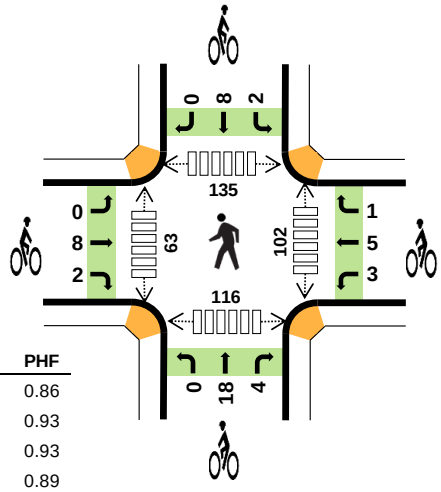
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bryant Ave
16th St

Peak Hour

Date: 02-19-2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	9.0%	0.86
WB	7.9%	0.93
NB	4.3%	0.93
SB	11.4%	0.89
TOTAL	7.7%	0.97

Two-Hour Count Summaries

Interval Start		16th St Eastbound				16th St Westbound				Bryant Ave Northbound				Bryant Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	1	80	3	0	1	134	23	0	12	41	10	0	7	19	9	340	0
7:15 AM		0	3	76	4	0	4	120	30	0	6	55	13	0	12	23	8	354	0
7:30 AM		0	1	79	4	0	4	122	25	0	7	64	8	0	5	14	8	341	0
7:45 AM		**0**	**2**	**101**	**4**	**0**	**3**	**145**	**38**	**0**	**11**	**65**	**18**	**0**	**4**	**23**	**12**	**426**	1,461
8:00 AM		**0**	**4**	**112**	**9**	**0**	**3**	**147**	**33**	**0**	**6**	**91**	**14**	**0**	**4**	**19**	**18**	**460**	1,581
8:15 AM		**0**	**7**	**129**	**6**	**0**	**3**	**115**	**41**	**0**	**7**	**80**	**16**	**0**	**11**	**27**	**11**	**453**	1,680
8:30 AM		**0**	**4**	**102**	**7**	**0**	**6**	**118**	**42**	**0**	**12**	**92**	**9**	**0**	**8**	**24**	**14**	**438**	**1,777**
8:45 AM		0	8	90	8	0	9	108	24	0	5	84	17	0	16	34	18	421	1,772
Count Total		0	30	769	45	0	33	1,009	256	0	66	572	105	0	67	183	98	3,233	0
Peak Hour	**All**	**0**	**17**	**444**	**26**	**0**	**15**	**525**	**154**	**0**	**36**	**328**	**57**	**0**	**27**	**93**	**55**	**1,777**	**0**
	HV	**0**	**1**	**41**	**2**	**0**	**0**	**52**	**3**	**0**	**2**	**14**	**2**	**0**	**2**	**15**	**3**	**137**	**0**
	HV%	**-**	**6%**	**9%**	**8%**	**-**	**0%**	**10%**	**2%**	**-**	**6%**	**4%**	**4%**	**-**	**7%**	**16%**	**5%**	**8%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	14	18	4	2	*38*	1	0	2	2	*5*	14	10	23	10	*57*
7:15 AM	9	14	5	3	*31*	1	2	0	0	*3*	24	7	14	16	*61*
7:30 AM	12	11	3	4	*30*	2	1	2	0	*5*	19	15	31	18	*83*
7:45 AM	**9**	**17**	**5**	**7**	***38***	**2**	**1**	**3**	**1**	***7***	**21**	**18**	**29**	**22**	*90*
8:00 AM	**13**	**12**	**8**	**4**	***37***	**1**	**0**	**3**	**3**	***7***	**25**	**17**	**28**	**27**	*97*
8:15 AM	**13**	**12**	**1**	**5**	***31***	**3**	**3**	**10**	**3**	***19***	**24**	**15**	**47**	**44**	*130*
8:30 AM	**9**	**14**	**4**	**4**	***31***	**4**	**5**	**6**	**3**	***18***	**32**	**13**	**31**	**23**	***99***
8:45 AM	11	16	5	1	*33*	4	3	8	3	*18*	25	24	49	33	*131*
Count Total	90	114	35	30	*269*	18	15	34	15	*82*	184	119	252	193	*748*
Peak Hour	**44**	**55**	**18**	**20**	***137***	**10**	**9**	**22**	**10**	***51***	**102**	**63**	**135**	**116**	***416***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	16th St Eastbound				16th St Westbound				Bryant Ave Northbound				Bryant Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	13	1	0	0	18	0	0	1	3	0	0	0	2	0	38	0
7:15 AM	0	0	9	0	0	0	13	1	0	2	2	1	0	2	1	0	31	0
7:30 AM	0	0	11	1	0	0	11	0	0	0	3	0	0	1	2	1	30	0
7:45 AM	**0**	**0**	**9**	**0**	**0**	**0**	**17**	**0**	**0**	**1**	**4**	**0**	**0**	**0**	**5**	**2**	**38**	137
8:00 AM	**0**	**1**	**11**	**1**	**0**	**0**	**12**	**0**	**0**	**0**	**6**	**2**	**0**	**2**	**1**	**1**	**37**	136
8:15 AM	**0**	**0**	**12**	**1**	**0**	**0**	**10**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**0**	**31**	136
8:30 AM	**0**	**0**	**9**	**0**	**0**	**0**	**13**	**1**	**0**	**1**	**3**	**0**	**0**	**0**	**4**	**0**	**31**	**137**
8:45 AM	0	0	7	4	0	0	15	1	0	0	5	0	0	0	1	0	33	132
Count Total	0	1	81	8	0	0	109	5	0	5	27	3	0	5	21	4	269	0
Peak Hour	**0**	**1**	**41**	**2**	**0**	**0**	**52**	**3**	**0**	**2**	**14**	**2**	**0**	**2**	**15**	**3**	**137**	**0**

Two-Hour Count Summaries - Bikes

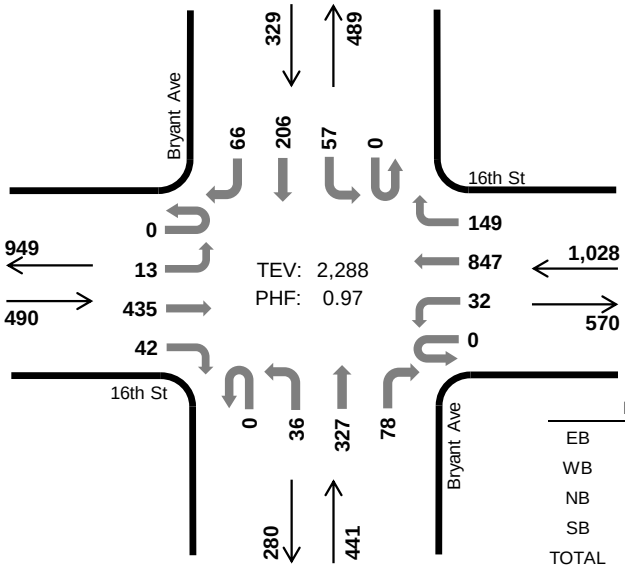
Interval Start	16th St Eastbound			16th St Westbound			Bryant Ave Northbound			Bryant Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	2	0	1	1	0	5	0
7:15 AM	0	1	0	1	1	0	0	0	0	0	0	0	3	0
7:30 AM	0	2	0	0	1	0	0	1	1	0	0	0	5	0
7:45 AM	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**0**	**7**	20
8:00 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**2**	**0**	**7**	22
8:15 AM	**0**	**2**	**1**	**2**	**1**	**0**	**0**	**9**	**1**	**0**	**3**	**0**	**19**	38
8:30 AM	**0**	**3**	**1**	**1**	**3**	**1**	**0**	**4**	**2**	**1**	**2**	**0**	**18**	**51**
8:45 AM	0	4	0	1	1	1	0	8	0	0	3	0	18	62
Count Total	0	16	2	5	8	2	0	29	5	3	12	0	82	0
Peak Hour	**0**	**8**	**2**	**3**	**5**	**1**	**0**	**18**	**4**	**2**	**8**	**0**	**51**	**0**

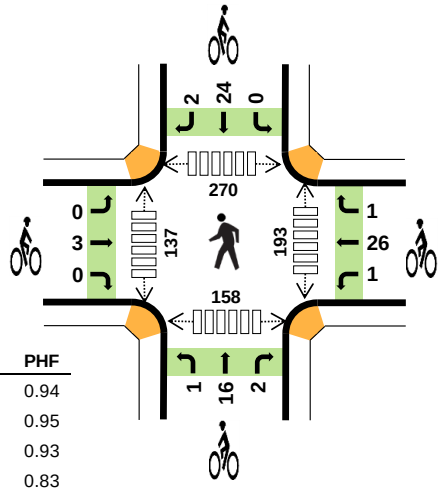
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bryant Ave
16th St

Peak Hour

Date: 02-19-2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	7.6%	0.94
WB	4.0%	0.95
NB	2.5%	0.93
SB	3.0%	0.83
TOTAL	4.3%	0.97

Two-Hour Count Summaries

Interval Start		16th St Eastbound				16th St Westbound				Bryant Ave Northbound				Bryant Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	5	89	9	0	16	159	47	0	10	64	24	0	18	42	9	492	0
4:15 PM		0	1	84	7	0	13	181	31	0	9	76	21	0	7	42	21	493	0
4:30 PM		0	8	99	7	0	3	217	42	0	10	67	16	0	7	42	15	533	0
4:45 PM		**0**	**4**	**107**	**14**	**0**	**7**	**204**	**37**	**0**	**9**	**83**	**27**	**0**	**11**	**45**	**13**	**561**	2,079
5:00 PM		**0**	**4**	**100**	**5**	**0**	**9**	**231**	**31**	**0**	**9**	**81**	**17**	**0**	**17**	**54**	**18**	**576**	2,163
5:15 PM		**0**	**3**	**114**	**13**	**0**	**5**	**197**	**40**	**0**	**6**	**93**	**19**	**0**	**14**	**62**	**23**	**589**	2,259
5:30 PM		**0**	**2**	**114**	**10**	**0**	**11**	**215**	**41**	**0**	**12**	**70**	**15**	**0**	**15**	**45**	**12**	**562**	**2,288**
5:45 PM		0	4	118	4	0	9	199	44	0	12	68	18	0	11	52	18	557	2,284
Count Total		0	31	825	69	0	73	1,603	313	0	77	602	157	0	100	384	129	4,363	0
Peak Hour	**All**	**0**	**13**	**435**	**42**	**0**	**32**	**847**	**149**	**0**	**36**	**327**	**78**	**0**	**57**	**206**	**66**	**2,288**	**0**
	HV	**0**	**0**	**37**	**0**	**0**	**0**	**41**	**0**	**0**	**3**	**6**	**2**	**0**	**0**	**9**	**1**	**99**	**0**
	HV%	**-**	**0%**	**9%**	**0%**	**-**	**0%**	**5%**	**0%**	**-**	**8%**	**2%**	**3%**	**-**	**0%**	**4%**	**2%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	11	11	1	2	*25*	0	6	6	1	*13*	39	30	48	27	*144*
4:15 PM	7	11	5	2	*25*	2	2	3	3	*10*	45	35	38	33	*151*
4:30 PM	10	12	2	3	*27*	0	6	1	4	*11*	48	37	65	28	*178*
4:45 PM	**12**	**8**	**2**	**2**	***24***	**1**	**3**	**1**	**6**	***11***	**51**	**35**	**58**	**45**	*189*
5:00 PM	**10**	**12**	**1**	**5**	***28***	**1**	**7**	**2**	**4**	***14***	**39**	**38**	**73**	**33**	*183*
5:15 PM	**7**	**10**	**5**	**2**	***24***	**1**	**8**	**8**	**6**	***23***	**55**	**30**	**65**	**45**	*195*
5:30 PM	**8**	**11**	**3**	**1**	***23***	**0**	**10**	**8**	**10**	***28***	**48**	**34**	**74**	**35**	***191***
5:45 PM	13	10	5	2	*30*	1	6	3	11	*21*	61	30	71	43	*205*
Count Total	78	85	24	19	*206*	6	48	32	45	*131*	386	269	492	289	*1,436*
Peak Hour	**37**	**41**	**11**	**10**	***99***	**3**	**28**	**19**	**26**	***76***	**193**	**137**	**270**	**158**	***758***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	16th St Eastbound				16th St Westbound				Bryant Ave Northbound				Bryant Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	10	1	0	0	10	1	0	0	1	0	0	0	0	2	25	0
4:15 PM	0	0	7	0	0	0	11	0	0	1	2	2	0	0	2	0	25	0
4:30 PM	0	0	10	0	0	0	12	0	0	0	2	0	0	0	2	1	27	0
4:45 PM	**0**	**0**	**12**	**0**	**0**	**0**	**8**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**0**	**24**	101
5:00 PM	**0**	**0**	**10**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**0**	**28**	104
5:15 PM	**0**	**0**	**7**	**0**	**0**	**0**	**10**	**0**	**0**	**2**	**2**	**1**	**0**	**0**	**1**	**1**	**24**	103
5:30 PM	**0**	**0**	**8**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**23**	**99**
5:45 PM	0	0	13	0	0	0	9	1	0	3	2	0	0	1	1	0	30	105
Count Total	0	0	77	1	0	0	83	2	0	7	13	4	0	1	14	4	206	0
Peak Hour	**0**	**0**	**37**	**0**	**0**	**0**	**41**	**0**	**0**	**3**	**6**	**2**	**0**	**0**	**9**	**1**	**99**	**0**

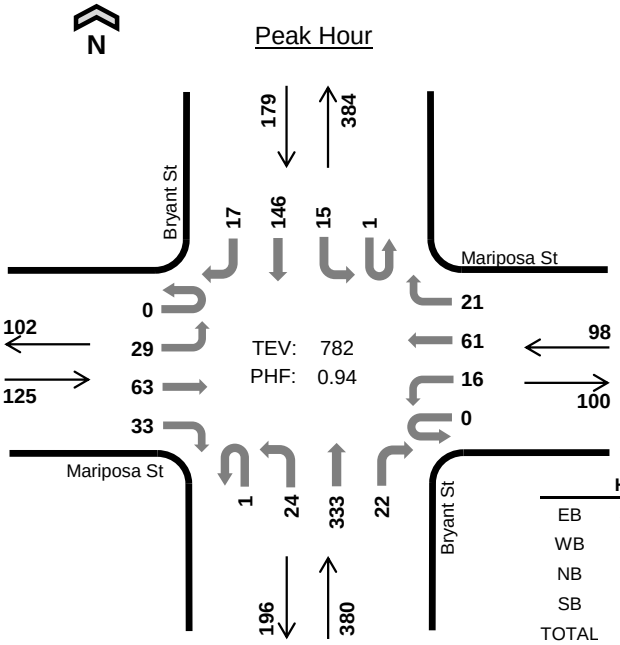
Two-Hour Count Summaries - Bikes

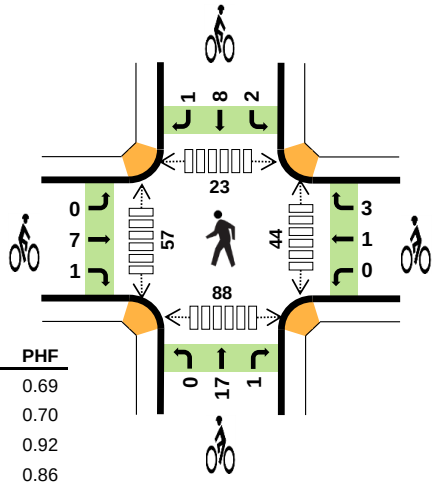
Interval Start	16th St Eastbound			16th St Westbound			Bryant Ave Northbound			Bryant Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	5	1	0	4	2	0	1	0	13	0
4:15 PM	0	2	0	0	2	0	0	3	0	0	2	1	10	0
4:30 PM	0	0	0	0	5	1	0	1	0	0	3	1	11	0
4:45 PM	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**11**	45
5:00 PM	**0**	**1**	**0**	**1**	**6**	**0**	**0**	**2**	**0**	**0**	**3**	**1**	**14**	46
5:15 PM	**0**	**1**	**0**	**0**	**8**	**0**	**0**	**8**	**0**	**0**	**6**	**0**	**23**	59
5:30 PM	**0**	**0**	**0**	**0**	**9**	**1**	**1**	**5**	**2**	**0**	**10**	**0**	**28**	**76**
5:45 PM	0	0	1	0	5	1	0	3	0	0	11	0	21	86
Count Total	0	5	1	1	43	4	1	27	4	0	41	4	131	0
Peak Hour	**0**	**3**	**0**	**1**	**26**	**1**	**1**	**16**	**2**	**0**	**24**	**2**	**76**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bryant St
Mariposa St

Date: 05-31-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	4.0%	0.69
WB	6.1%	0.70
NB	3.4%	0.92
SB	8.4%	0.86
TOTAL	5.0%	0.94

Two-Hour Count Summaries

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	4	6	8	0	5	11	14	0	2	36	4	1	5	31	3	130	0
7:15 AM	0	2	7	2	0	3	6	5	1	7	56	2	0	4	24	3	122	0
7:30 AM	0	4	6	5	0	9	8	5	0	6	81	4	0	7	36	5	176	0
7:45 AM	0	10	17	5	0	5	11	8	0	5	78	4	0	6	33	2	184	612
8:00 AM	**0**	**10**	**18**	**17**	**0**	**4**	**11**	**6**	**0**	**5**	**87**	**8**	**0**	**5**	**34**	**3**	**208**	690
8:15 AM	**0**	**12**	**14**	**7**	**0**	**9**	**11**	**4**	**0**	**7**	**70**	**5**	**0**	**1**	**49**	**2**	**191**	759
8:30 AM	**0**	**5**	**11**	**1**	**0**	**0**	**12**	**6**	**1**	**9**	**89**	**4**	**1**	**6**	**26**	**7**	**178**	761
8:45 AM	**0**	**2**	**20**	**8**	**0**	**3**	**27**	**5**	**0**	**3**	**87**	**5**	**0**	**3**	**37**	**5**	**205**	**782**
Count Total	0	49	99	53	0	38	97	53	2	44	584	36	2	37	270	30	1,394	0
Peak Hour All	**0**	**29**	**63**	**33**	**0**	**16**	**61**	**21**	**1**	**24**	**333**	**22**	**1**	**15**	**146**	**17**	**782**	**0**
Peak Hour HV	**0**	**0**	**3**	**2**	**0**	**1**	**2**	**3**	**0**	**0**	**11**	**2**	**0**	**0**	**15**	**0**	**39**	**0**
Peak Hour HV%	**-**	**0%**	**5%**	**6%**	**-**	**6%**	**3%**	**14%**	**0%**	**0%**	**3%**	**9%**	**0%**	**0%**	**10%**	**0%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	9	1	5	*17*	1	0	2	0	*3*	8	18	8	8	*42*
7:15 AM	0	2	4	6	*12*	2	0	3	0	*5*	7	12	2	14	*35*
7:30 AM	0	3	5	4	*12*	4	0	1	1	*6*	6	14	2	16	*38*
7:45 AM	1	3	2	4	*10*	3	0	1	0	*4*	8	19	8	15	*50*
8:00 AM	**1**	**2**	**5**	**6**	***14***	**2**	**0**	**4**	**2**	***8***	**11**	**11**	**7**	**18**	*47*
8:15 AM	**2**	**3**	**2**	**3**	***10***	**2**	**0**	**3**	**4**	***9***	**5**	**15**	**4**	**14**	*38*
8:30 AM	**0**	**1**	**4**	**5**	***10***	**3**	**3**	**4**	**2**	***12***	**8**	**19**	**5**	**27**	*59*
8:45 AM	**2**	**0**	**2**	**1**	***5***	**1**	**1**	**7**	**3**	***12***	**20**	**12**	**7**	**29**	***68***
Count Total	8	23	25	34	*90*	18	4	25	12	*59*	73	120	43	141	*377*
Peak Hour	**5**	**6**	**13**	**15**	***39***	**8**	**4**	**18**	**11**	***41***	**44**	**57**	**23**	**88**	***212***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	1	0	0	0	2	7	0	0	1	0	0	0	4	1	17	0
7:15 AM	0	0	0	0	0	0	0	2	0	1	3	0	0	1	4	1	12	0
7:30 AM	0	0	0	0	0	0	0	3	0	0	5	0	0	1	2	1	12	0
7:45 AM	0	0	1	0	0	1	1	1	0	0	2	0	0	0	4	0	10	51
8:00 AM	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**4**	**1**	**0**	**0**	**6**	**0**	**14**	48
8:15 AM	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**10**	46
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**5**	**0**	**10**	44
8:45 AM	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**5**	**39**
Count Total	0	1	5	2	0	2	5	16	0	1	22	2	0	2	29	3	90	0
Peak Hour	**0**	**0**	**3**	**2**	**0**	**1**	**2**	**3**	**0**	**0**	**11**	**2**	**0**	**0**	**15**	**0**	**39**	**0**

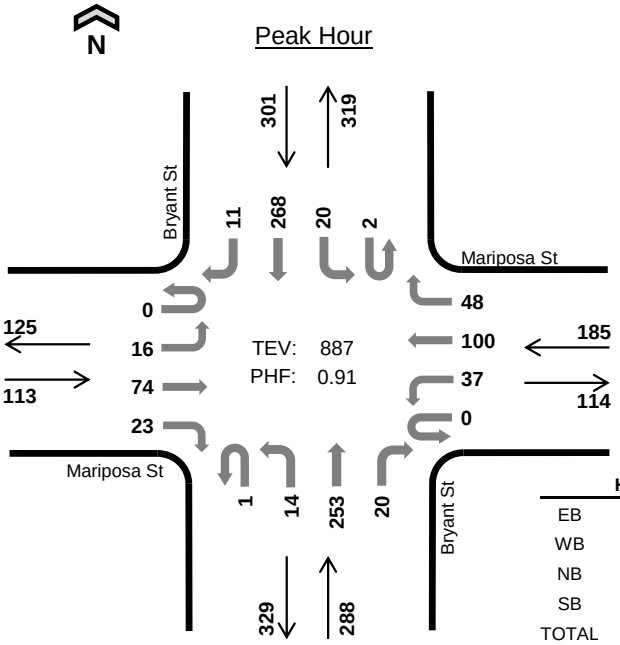
Two-Hour Count Summaries - Bikes

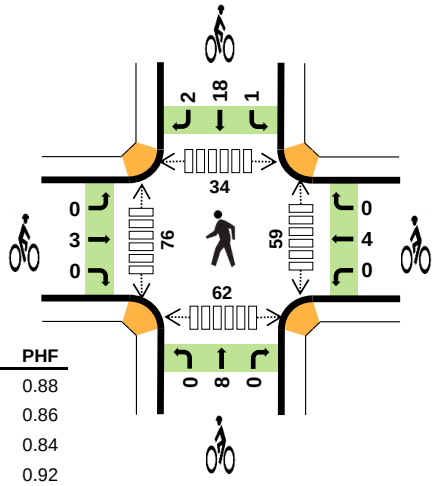
Interval Start	Mariposa St Eastbound			Mariposa St Westbound			Bryant St Northbound			Bryant St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	2	0	0	0	0	3	0
7:15 AM	0	2	0	0	0	0	1	2	0	0	0	0	5	0
7:30 AM	1	3	0	0	0	0	0	1	0	0	1	0	6	0
7:45 AM	1	2	0	0	0	0	0	1	0	0	0	0	4	18
8:00 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**0**	**2**	**0**	**8**	23
8:15 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**3**	**1**	**9**	27
8:30 AM	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**4**	**0**	**2**	**0**	**0**	**12**	33
8:45 AM	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**7**	**0**	**0**	**3**	**0**	**12**	**41**
Count Total	2	15	1	0	1	3	1	23	1	2	9	1	59	0
Peak Hour	**0**	**7**	**1**	**0**	**1**	**3**	**0**	**17**	**1**	**2**	**8**	**1**	**41**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bryant St
Mariposa St

Date: 05-31-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	2.7%	0.88
WB	1.6%	0.86
NB	3.1%	0.84
SB	3.7%	0.92
TOTAL	2.9%	0.91

Two-Hour Count Summaries

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	3	17	9	0	3	14	9	1	3	81	2	0	4	60	4	210	0
4:15 PM	0	5	5	5	0	2	17	13	0	5	78	3	0	1	52	0	186	0
4:30 PM	0	4	16	9	0	4	13	8	1	3	73	5	0	7	65	4	212	0
4:45 PM	0	2	14	7	0	4	13	13	0	5	70	5	0	3	65	3	204	812
5:00 PM	**0**	**6**	**18**	**8**	**0**	**6**	**16**	**6**	**0**	**5**	**64**	**2**	**0**	**2**	**64**	**3**	**200**	802
5:15 PM	**0**	**4**	**19**	**5**	**0**	**10**	**27**	**17**	**0**	**4**	**77**	**5**	**2**	**8**	**62**	**4**	**244**	860
5:30 PM	**0**	**1**	**25**	**5**	**0**	**9**	**29**	**12**	**0**	**2**	**58**	**7**	**0**	**7**	**74**	**1**	**230**	878
5:45 PM	**0**	**5**	**12**	**5**	**0**	**12**	**28**	**13**	**1**	**3**	**54**	**6**	**0**	**3**	**68**	**3**	**213**	**887**
Count Total	0	30	126	53	0	50	157	91	3	30	555	35	2	35	510	22	1,699	0
Peak Hour All	**0**	**16**	**74**	**23**	**0**	**37**	**100**	**48**	**1**	**14**	**253**	**20**	**2**	**20**	**268**	**11**	**887**	**0**
Peak Hour HV	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**9**	**0**	**0**	**3**	**8**	**0**	**26**	**0**
Peak Hour HV%	**-**	**0%**	**4%**	**0%**	**-**	**0%**	**2%**	**2%**	**0%**	**0%**	**4%**	**0%**	**0%**	**15%**	**3%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	1	2	6	*10*	0	2	2	1	*5*	11	20	6	24	*61*
4:15 PM	0	0	1	0	*1*	0	1	3	2	*6*	13	20	7	14	*54*
4:30 PM	0	0	2	3	*5*	0	1	0	2	*3*	9	19	6	18	*52*
4:45 PM	1	0	2	1	*4*	0	0	0	1	*1*	12	21	5	11	*49*
5:00 PM	**1**	**0**	**2**	**3**	***6***	**1**	**3**	**2**	**5**	***11***	**17**	**15**	**6**	**17**	*55*
5:15 PM	**2**	**1**	**3**	**2**	***8***	**1**	**0**	**3**	**6**	***10***	**10**	**10**	**10**	**14**	*44*
5:30 PM	**0**	**1**	**1**	**2**	***4***	**0**	**1**	**2**	**4**	***7***	**17**	**20**	**8**	**20**	*65*
5:45 PM	**0**	**1**	**3**	**4**	***8***	**1**	**0**	**1**	**6**	***8***	**15**	**31**	**10**	**11**	***67***
Count Total	5	4	16	21	*46*	3	8	13	27	*51*	104	156	58	129	*447*
Peak Hour	**3**	**3**	**9**	**11**	***26***	**3**	**4**	**8**	**21**	***36***	**59**	**76**	**34**	**62**	***231***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	0	1	0	0	2	0	0	0	5	1	10	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1	5	0
4:45 PM	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	4	20
5:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**6**	16
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**8**	23
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**4**	22
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**2**	**2**	**0**	**8**	**26**
Count Total	0	0	5	0	0	0	2	2	0	0	16	0	0	3	16	2	46	0
Peak Hour	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**9**	**0**	**0**	**3**	**8**	**0**	**26**	**0**

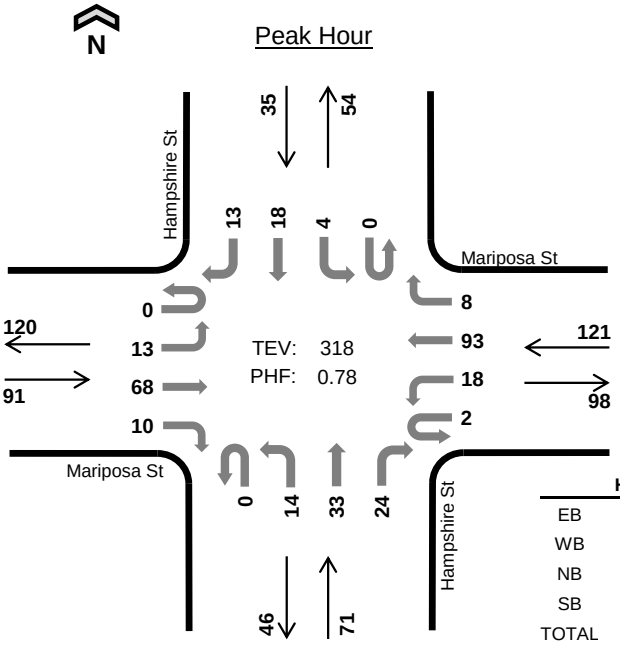
Two-Hour Count Summaries - Bikes

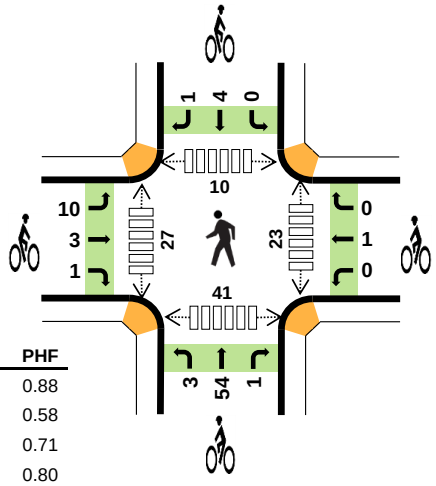
Interval Start	Mariposa St Eastbound			Mariposa St Westbound			Bryant St Northbound			Bryant St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	2	0	0	2	0	0	1	0	5	0
4:15 PM	0	0	0	0	1	0	0	3	0	0	2	0	6	0
4:30 PM	0	0	0	0	1	0	0	0	0	0	2	0	3	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	15
5:00 PM	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**2**	**0**	**0**	**5**	**0**	**11**	21
5:15 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**5**	**0**	**10**	25
5:30 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**4**	**0**	**7**	29
5:45 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	**2**	**8**	**36**
Count Total	0	3	0	0	8	0	0	13	0	1	24	2	51	0
Peak Hour	**0**	**3**	**0**	**0**	**4**	**0**	**0**	**8**	**0**	**1**	**18**	**2**	**36**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hampshire St
Mariposa St

Date: 05-31-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	5.5%	0.88
WB	4.1%	0.58
NB	4.2%	0.71
SB	5.7%	0.80
TOTAL	4.7%	0.78

Two-Hour Count Summaries

Interval Start		Mariposa St Eastbound				Mariposa St Westbound				Hampshire St Northbound				Hampshire St Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		1	2	8	1	0	2	18	1	0	0	4	0	0	1	1	4	43	0
7:15 AM		0	3	10	1	0	1	14	1	0	1	3	3	0	1	3	1	42	0
7:30 AM		0	3	6	4	0	3	17	0	0	3	3	3	0	1	1	1	45	0
7:45 AM		0	2	16	2	0	2	18	0	0	4	7	4	0	3	5	2	65	195
8:00 AM		**0**	**4**	**21**	**1**	**0**	**4**	**20**	**1**	**0**	**2**	**5**	**4**	**0**	**2**	**6**	**2**	**72**	224
8:15 AM		**0**	**5**	**16**	**3**	**0**	**1**	**20**	**0**	**0**	**2**	**13**	**10**	**0**	**0**	**3**	**3**	**76**	258
8:30 AM		**0**	**1**	**14**	**3**	**2**	**2**	**16**	**3**	**0**	**5**	**5**	**6**	**0**	**1**	**4**	**6**	**68**	281
8:45 AM		**0**	**3**	**17**	**3**	**0**	**11**	**37**	**4**	**0**	**5**	**10**	**4**	**0**	**1**	**5**	**2**	**102**	**318**
Count Total		1	23	108	18	2	26	160	10	0	22	50	34	0	10	28	21	513	0
Peak Hour	**All**	**0**	**13**	**68**	**10**	**2**	**18**	**93**	**8**	**0**	**14**	**33**	**24**	**0**	**4**	**18**	**13**	**318**	**0**
	HV	**0**	**0**	**4**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**1**	**15**	**0**
	HV%	**-**	**0%**	**6%**	**10%**	**0%**	**0%**	**5%**	**0%**	**-**	**7%**	**3%**	**4%**	**-**	**25%**	**0%**	**8%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	1	0	0	*2*	2	0	3	1	*6*	2	2	3	1	*8*
7:15 AM	0	0	0	0	*0*	2	0	4	0	*6*	2	5	2	4	*13*
7:30 AM	1	0	0	0	*1*	3	0	9	1	*13*	3	6	2	0	*11*
7:45 AM	1	1	0	0	*2*	2	0	9	0	*11*	2	7	7	3	*19*
8:00 AM	**1**	**3**	**1**	**1**	***6***	**3**	**0**	**10**	**1**	***14***	**1**	**5**	**4**	**4**	*14*
8:15 AM	**2**	**1**	**1**	**0**	***4***	**4**	**0**	**16**	**2**	***22***	**6**	**12**	**2**	**10**	*30*
8:30 AM	**0**	**0**	**0**	**1**	***1***	**5**	**1**	**17**	**1**	***24***	**10**	**4**	**1**	**10**	*25*
8:45 AM	**2**	**1**	**1**	**0**	***4***	**2**	**0**	**15**	**1**	***18***	**6**	**6**	**3**	**17**	***32***
Count Total	8	7	3	2	*20*	23	1	83	7	*114*	32	47	24	49	*152*
Peak Hour	**5**	**5**	**3**	**2**	***15***	**14**	**1**	**58**	**5**	***78***	**23**	**27**	**10**	**41**	***101***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Hampshire St Northbound				Hampshire St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	5
8:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**6**	9
8:15 AM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	13
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	13
8:45 AM	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**15**
Count Total	0	0	6	2	0	0	7	0	0	1	1	1	0	1	0	1	20	0
Peak Hour	**0**	**0**	**4**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**1**	**15**	**0**

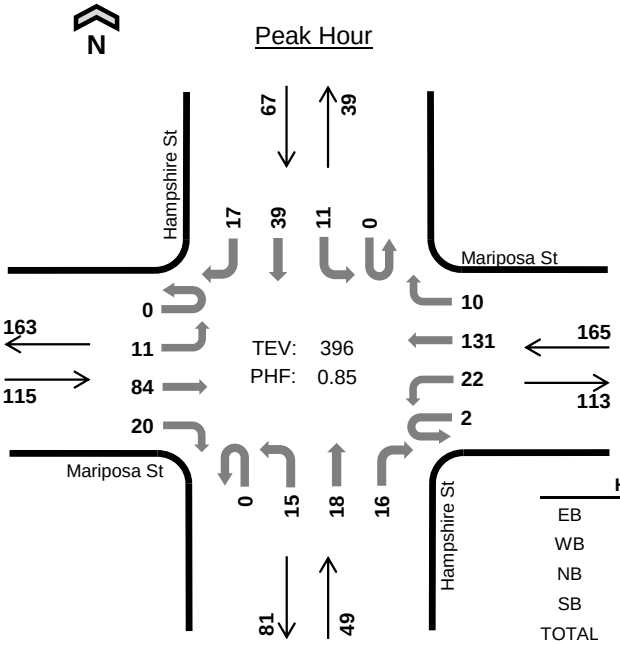
Two-Hour Count Summaries - Bikes

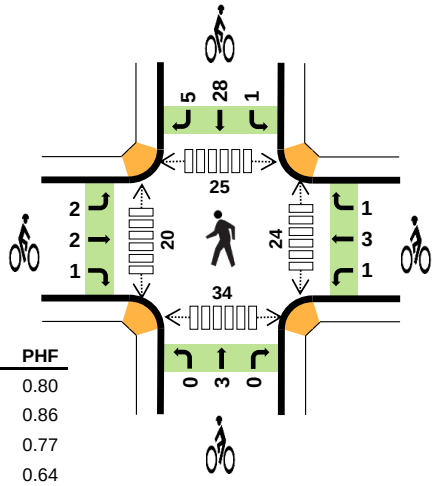
Interval Start	Mariposa St Eastbound			Mariposa St Westbound			Hampshire St Northbound			Hampshire St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	2	0	0	0	0	0	0	2	1	1	0	0	6	0
7:15 AM	1	1	0	0	0	0	0	4	0	0	0	0	6	0
7:30 AM	0	3	0	0	0	0	1	6	2	0	1	0	13	0
7:45 AM	2	0	0	0	0	0	0	9	0	0	0	0	11	36
8:00 AM	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**9**	**1**	**0**	**1**	**0**	**14**	44
8:15 AM	**3**	**1**	**0**	**0**	**0**	**0**	**1**	**15**	**0**	**0**	**2**	**0**	**22**	60
8:30 AM	**3**	**1**	**1**	**0**	**1**	**0**	**0**	**17**	**0**	**0**	**1**	**0**	**24**	71
8:45 AM	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**13**	**0**	**0**	**0**	**1**	**18**	**78**
Count Total	15	7	1	0	1	0	4	75	4	1	5	1	114	0
Peak Hour	**10**	**3**	**1**	**0**	**1**	**0**	**3**	**54**	**1**	**0**	**4**	**1**	**78**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hampshire St
Mariposa St

Date: 05-31-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	2.6%	0.80
WB	1.8%	0.86
NB	4.1%	0.77
SB	0.0%	0.64
TOTAL	2.0%	0.85

Two-Hour Count Summaries

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Hampshire St Northbound				Hampshire St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	27	4	0	4	18	1	0	6	4	9	0	3	6	0	83	0
4:15 PM	0	1	11	1	0	4	12	2	0	7	4	6	0	0	3	5	56	0
4:30 PM	0	2	24	4	0	2	14	2	0	5	8	4	0	6	12	3	86	0
4:45 PM	0	1	18	2	1	3	16	3	0	7	8	8	0	3	8	4	82	307
5:00 PM	**0**	**4**	**19**	**3**	**0**	**3**	**19**	**3**	**0**	**4**	**3**	**8**	**0**	**7**	**9**	**2**	**84**	308
5:15 PM	**0**	**2**	**24**	**5**	**0**	**9**	**37**	**2**	**0**	**3**	**9**	**4**	**0**	**1**	**8**	**3**	**107**	359
5:30 PM	**0**	**3**	**22**	**11**	**1**	**4**	**38**	**2**	**0**	**4**	**5**	**1**	**0**	**2**	**15**	**9**	**117**	390
5:45 PM	**0**	**2**	**19**	**1**	**1**	**6**	**37**	**3**	**0**	**4**	**1**	**3**	**0**	**1**	**7**	**3**	**88**	**396**
Count Total	0	16	164	31	3	35	191	18	0	40	42	43	0	23	68	29	703	0
Peak Hour All	**0**	**11**	**84**	**20**	**2**	**22**	**131**	**10**	**0**	**15**	**18**	**16**	**0**	**11**	**39**	**17**	**396**	**0**
Peak Hour HV	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**8**	**0**
Peak Hour HV%	**-**	**0%**	**2%**	**5%**	**0%**	**0%**	**2%**	**0%**	**-**	**0%**	**0%**	**13%**	**-**	**0%**	**0%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	0	0	0	*2*	0	3	1	2	*6*	8	1	3	4	*16*
4:15 PM	0	0	0	1	*1*	1	1	0	1	*3*	4	3	6	7	*20*
4:30 PM	0	0	0	1	*1*	0	1	0	4	*5*	4	8	2	10	*24*
4:45 PM	1	0	0	0	*1*	1	0	1	4	*6*	2	4	5	2	*13*
5:00 PM	**1**	**0**	**1**	**0**	***2***	**0**	**2**	**1**	**9**	***12***	**8**	**7**	**2**	**11**	*28*
5:15 PM	**2**	**1**	**0**	**0**	***3***	**2**	**1**	**1**	**7**	***11***	**2**	**4**	**8**	**7**	*21*
5:30 PM	**0**	**2**	**0**	**0**	***2***	**1**	**2**	**0**	**8**	***11***	**6**	**6**	**7**	**8**	*27*
5:45 PM	**0**	**0**	**1**	**0**	***1***	**2**	**0**	**1**	**10**	***13***	**8**	**3**	**8**	**8**	***27***
Count Total	6	3	2	2	*13*	7	10	5	45	*67*	42	36	41	57	*176*
Peak Hour	**3**	**3**	**2**	**0**	***8***	**5**	**5**	**3**	**34**	***47***	**24**	**20**	**25**	**34**	***103***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				Hampshire St Northbound				Hampshire St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
5:00 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	5
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	7
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	8
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**8**
Count Total	0	0	5	1	0	0	3	0	0	0	0	2	0	0	2	0	13	0
Peak Hour	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**8**	**0**

Two-Hour Count Summaries - Bikes

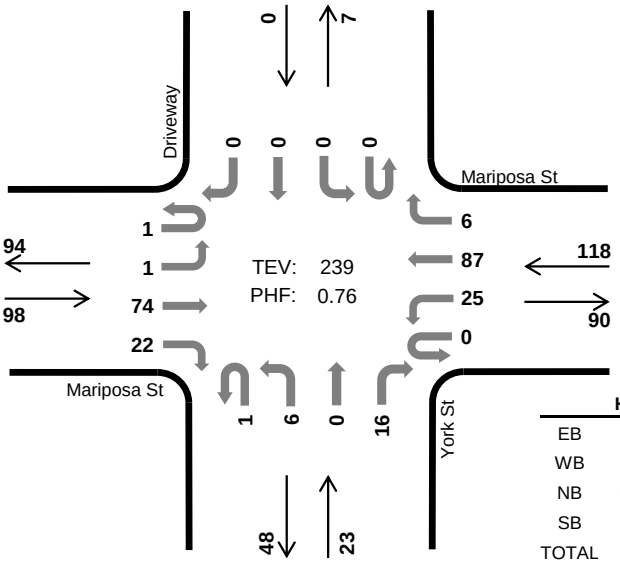
Interval Start	Mariposa St Eastbound			Mariposa St Westbound			Hampshire St Northbound			Hampshire St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	2	1	0	0	1	0	0	2	0	6	0
4:15 PM	1	0	0	1	0	0	0	0	0	0	0	1	3	0
4:30 PM	0	0	0	0	1	0	0	0	0	0	3	1	5	0
4:45 PM	0	1	0	0	0	0	0	1	0	0	4	0	6	20
5:00 PM	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**1**	**6**	**2**	**12**	26
5:15 PM	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**6**	**1**	**11**	34
5:30 PM	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**11**	40
5:45 PM	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	**2**	**13**	**47**
Count Total	3	3	1	4	5	1	0	5	0	1	37	7	67	0
Peak Hour	**2**	**2**	**1**	**1**	**3**	**1**	**0**	**3**	**0**	**1**	**28**	**5**	**47**	**0**

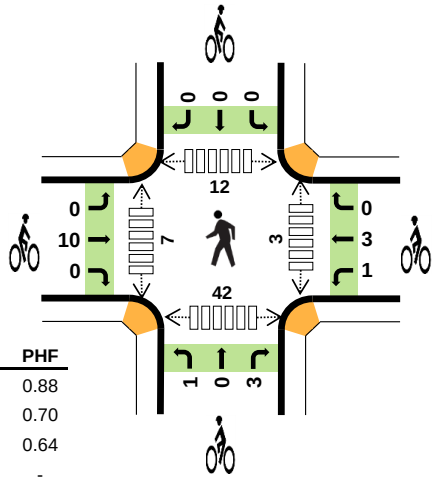
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

York St
Mariposa St

Date: 05-31-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour





	HV %:	PHF
EB	5.1%	0.88
WB	6.8%	0.70
NB	4.3%	0.64
SB	-	-
TOTAL	5.9%	0.76

Two-Hour Count Summaries

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				York St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	1	0	9	5	0	6	18	0	0	3	0	0	0	1	0	0	43	0
7:15 AM	0	0	13	3	0	5	11	1	0	2	0	2	0	0	0	0	37	0
7:30 AM	1	1	10	3	0	5	15	1	0	2	0	3	0	0	0	0	41	0
7:45 AM	0	0	19	8	0	5	20	0	0	2	0	1	0	0	0	0	55	176
8:00 AM	**0**	**0**	**21**	**6**	**0**	**5**	**16**	**1**	**0**	**3**	**0**	**5**	**0**	**0**	**0**	**0**	**57**	190
8:15 AM	**0**	**0**	**20**	**2**	**0**	**2**	**24**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**52**	205
8:30 AM	**0**	**0**	**15**	**6**	**0**	**7**	**18**	**3**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**51**	215
8:45 AM	**1**	**1**	**18**	**8**	**0**	**11**	**29**	**2**	**0**	**3**	**0**	**6**	**0**	**0**	**0**	**0**	**79**	**239**
Count Total	3	2	125	41	0	46	151	8	1	15	0	22	0	1	0	0	415	0
Peak Hour All	**1**	**1**	**74**	**22**	**0**	**25**	**87**	**6**	**1**	**6**	**0**	**16**	**0**	**0**	**0**	**0**	**239**	**0**
Peak Hour HV	**0**	**1**	**4**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**14**	**0**
Peak Hour HV%	**0%**	**100%**	**5%**	**0%**	**-**	**0%**	**5%**	**67%**	**0%**	**0%**	**-**	**6%**	**-**	**-**	**-**	**-**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	3	0	0	*4*	1	0	1	0	*2*	0	1	3	4	*8*
7:15 AM	1	1	0	0	*2*	1	0	0	0	*1*	1	2	1	5	*9*
7:30 AM	1	1	0	0	*2*	3	1	1	0	*5*	0	1	0	3	*4*
7:45 AM	1	1	0	0	*2*	2	0	0	0	*2*	1	1	6	11	*19*
8:00 AM	**1**	**1**	**0**	**0**	***2***	**2**	**0**	**0**	**0**	***2***	**1**	**2**	**4**	**10**	*17*
8:15 AM	**2**	**3**	**0**	**0**	***5***	**2**	**0**	**2**	**0**	***4***	**0**	**2**	**1**	**7**	*10*
8:30 AM	**0**	**2**	**0**	**0**	***2***	**5**	**2**	**1**	**0**	***8***	**0**	**1**	**1**	**11**	*13*
8:45 AM	**2**	**2**	**1**	**0**	***5***	**1**	**2**	**1**	**0**	***4***	**2**	**2**	**6**	**14**	***24***
Count Total	9	14	1	0	*24*	17	5	6	0	*28*	5	12	22	65	*104*
Peak Hour	**5**	**8**	**1**	**0**	***14***	**10**	**4**	**4**	**0**	***18***	**3**	**7**	**12**	**42**	***64***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				York St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0
7:15 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0
7:30 AM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0
7:45 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	10
8:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	8
8:15 AM	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	11
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	11
8:45 AM	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**14**
Count Total	0	2	7	0	0	0	8	6	0	0	0	1	0	0	0	0	24	0
Peak Hour	**0**	**1**	**4**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**14**	**0**

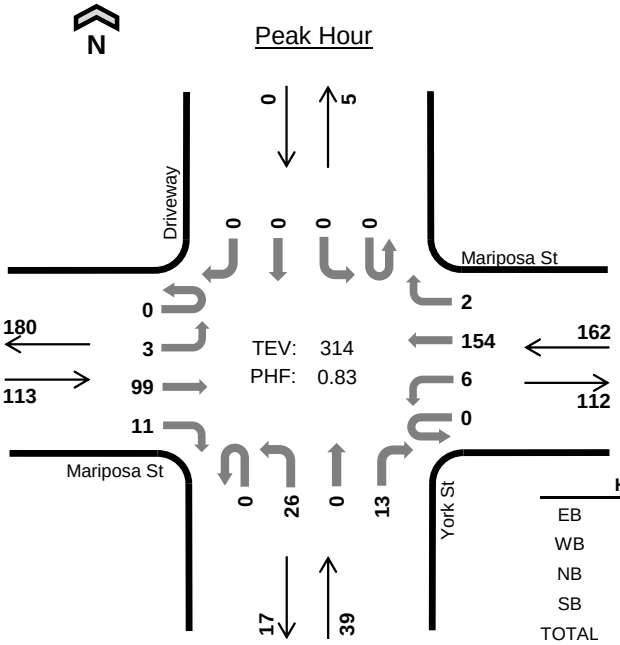
Two-Hour Count Summaries - Bikes

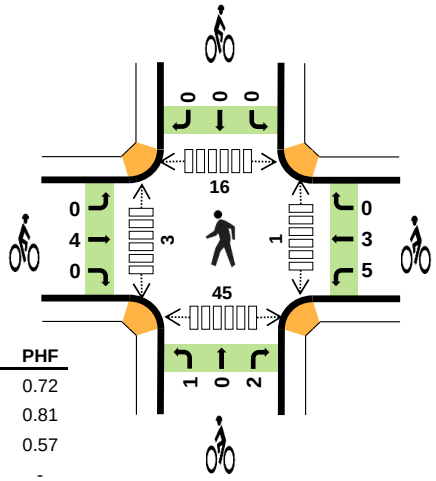
Interval Start	Mariposa St Eastbound			Mariposa St Westbound			York St Northbound			Driveway Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	1	0	0	0	2	0
7:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	3	0	0	1	0	0	0	1	0	0	0	5	0
7:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2	10
8:00 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	10
8:15 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**4**	13
8:30 AM	**0**	**5**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**8**	16
8:45 AM	**0**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**4**	**18**
Count Total	0	17	0	1	4	0	1	0	5	0	0	0	28	0
Peak Hour	**0**	**10**	**0**	**1**	**3**	**0**	**1**	**0**	**3**	**0**	**0**	**0**	**18**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

York St
Mariposa St

Date: 05-31-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	4.4%	0.72
WB	1.9%	0.81
NB	2.6%	0.57
SB	-	-
TOTAL	2.9%	0.83

Two-Hour Count Summaries

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				York St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	24	2	0	3	22	0	0	8	0	7	0	0	0	0	66	0
4:15 PM	0	0	8	2	0	3	20	0	0	8	0	5	0	0	0	0	46	0
4:30 PM	0	0	27	1	0	2	21	0	0	5	0	4	0	0	0	0	60	0
4:45 PM	0	0	18	2	0	4	22	0	0	7	0	3	0	0	0	0	56	228
5:00 PM	**0**	**0**	**20**	**3**	**0**	**2**	**23**	**0**	**0**	**4**	**0**	**5**	**0**	**0**	**0**	**0**	**57**	219
5:15 PM	**0**	**0**	**26**	**5**	**0**	**1**	**41**	**0**	**0**	**13**	**0**	**4**	**0**	**0**	**0**	**0**	**90**	263
5:30 PM	**0**	**1**	**35**	**3**	**0**	**2**	**46**	**2**	**0**	**4**	**0**	**2**	**0**	**0**	**0**	**0**	**95**	298
5:45 PM	**0**	**2**	**18**	**0**	**0**	**1**	**44**	**0**	**0**	**5**	**0**	**2**	**0**	**0**	**0**	**0**	**72**	**314**
Count Total	0	3	176	18	0	18	239	2	0	54	0	32	0	0	0	0	542	0
Peak Hour All	**0**	**3**	**99**	**11**	**0**	**6**	**154**	**2**	**0**	**26**	**0**	**13**	**0**	**0**	**0**	**0**	**314**	**0**
Peak Hour HV	**0**	**3**	**2**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**9**	**0**
Peak Hour HV%	**-**	**100%**	**2%**	**0%**	**-**	**0%**	**1%**	**50%**	**-**	**0%**	**-**	**8%**	**-**	**-**	**-**	**-**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	2	0	*3*	0	1	0	0	*1*	0	3	3	5	*11*
4:15 PM	0	0	0	0	*0*	0	2	1	0	*3*	0	1	2	15	*18*
4:30 PM	0	0	0	0	*0*	0	2	0	0	*2*	0	3	0	11	*14*
4:45 PM	1	0	0	0	*1*	0	0	1	0	*1*	0	0	4	8	*12*
5:00 PM	**1**	**0**	**1**	**0**	***2***	**1**	**4**	**1**	**0**	***6***	**1**	**1**	**3**	**15**	*20*
5:15 PM	**1**	**1**	**0**	**0**	***2***	**2**	**1**	**0**	**0**	***3***	**0**	**1**	**3**	**11**	*15*
5:30 PM	**1**	**2**	**0**	**0**	***3***	**0**	**1**	**1**	**0**	***2***	**0**	**0**	**4**	**15**	*19*
5:45 PM	**2**	**0**	**0**	**0**	***2***	**1**	**2**	**1**	**0**	***4***	**0**	**1**	**6**	**4**	***11***
Count Total	7	3	3	0	*13*	4	13	5	0	*22*	1	10	25	84	*120*
Peak Hour	**5**	**3**	**1**	**0**	***9***	**4**	**8**	**3**	**0**	***15***	**1**	**3**	**16**	**45**	***65***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Mariposa St Eastbound				Mariposa St Westbound				York St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	3	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
5:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	3
5:15 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	5
5:30 PM	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	8
5:45 PM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**9**
Count Total	0	3	4	0	0	0	2	1	0	1	0	2	0	0	0	0	13	0
Peak Hour	**0**	**3**	**2**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**9**	**0**

Two-Hour Count Summaries - Bikes

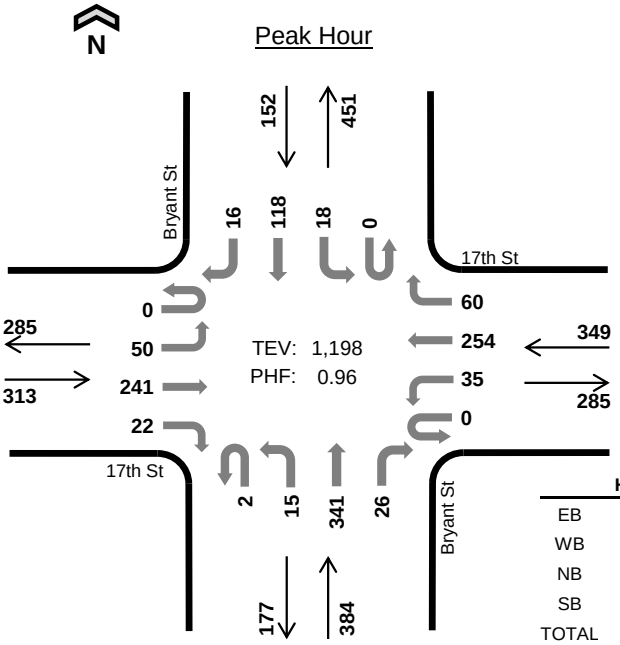
Interval Start	Mariposa St Eastbound			Mariposa St Westbound			York St Northbound			Driveway Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	1	1	0	0	0	1	0	0	0	3	0
4:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	2	0
4:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	7
5:00 PM	**0**	**1**	**0**	**2**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**6**	12
5:15 PM	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	12
5:30 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	12
5:45 PM	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**4**	**15**
Count Total	0	4	0	7	6	0	1	0	4	0	0	0	22	0
Peak Hour	**0**	**4**	**0**	**5**	**3**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**15**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

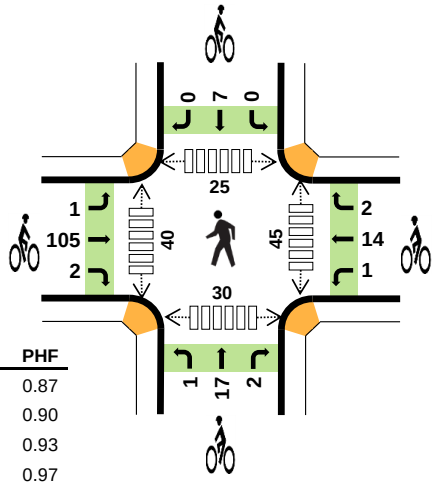
Bryant St
17th St

Peak Hour

Date: 05-31-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	4.5%	0.87
WB	4.3%	0.90
NB	3.9%	0.93
SB	9.9%	0.97
TOTAL	4.9%	0.96



Two-Hour Count Summaries

Interval Start		17th St Eastbound				17th St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	6	20	2	0	6	58	18	0	5	49	3	0	3	31	1	202	0
7:15 AM		0	5	30	5	0	8	43	16	0	1	56	7	0	5	21	1	198	0
7:30 AM		0	10	48	1	0	10	58	11	0	6	73	7	0	7	34	2	267	0
7:45 AM		**0**	**10**	**46**	**8**	**0**	**7**	**65**	**18**	**0**	**7**	**80**	**9**	**0**	**8**	**28**	**3**	**289**	956
8:00 AM		**0**	**10**	**55**	**6**	**0**	**8**	**73**	**16**	**0**	**4**	**90**	**8**	**0**	**6**	**27**	**3**	**306**	1,060
8:15 AM		**0**	**14**	**71**	**5**	**0**	**13**	**51**	**15**	**0**	**2**	**75**	**6**	**0**	**1**	**32**	**6**	**291**	1,153
8:30 AM		**0**	**16**	**69**	**3**	**0**	**7**	**65**	**11**	**2**	**2**	**96**	**3**	**0**	**3**	**31**	**4**	**312**	**1,198**
8:45 AM		0	15	50	2	0	6	61	14	0	3	84	5	0	1	34	3	278	1,187
Count Total		0	86	389	32	0	65	474	119	2	30	603	48	0	34	238	23	2,143	0
Peak Hour	**All**	**0**	**50**	**241**	**22**	**0**	**35**	**254**	**60**	**2**	**15**	**341**	**26**	**0**	**18**	**118**	**16**	**1,198**	**0**
	HV	**0**	**4**	**8**	**2**	**0**	**5**	**7**	**3**	**0**	**1**	**13**	**1**	**0**	**2**	**10**	**3**	**59**	**0**
	HV%	**-**	**8%**	**3%**	**9%**	**-**	**14%**	**3%**	**5%**	**0%**	**7%**	**4%**	**4%**	**-**	**11%**	**8%**	**19%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	1	10	5	*17*	4	1	1	0	*6*	10	13	4	6	*33*
7:15 AM	0	2	4	5	*11*	11	0	0	1	*12*	3	5	6	1	*15*
7:30 AM	3	2	8	2	*15*	18	0	5	2	*25*	13	5	2	9	*29*
7:45 AM	**7**	**6**	**3**	**6**	***22***	**31**	**2**	**3**	**1**	***37***	**9**	**14**	**1**	**5**	*29*
8:00 AM	**3**	**5**	**4**	**3**	***15***	**23**	**6**	**5**	**2**	***36***	**12**	**5**	**3**	**3**	*23*
8:15 AM	**2**	**3**	**3**	**2**	***10***	**27**	**7**	**2**	**3**	***39***	**14**	**8**	**11**	**12**	*45*
8:30 AM	**2**	**1**	**5**	**4**	***12***	**27**	**2**	**10**	**1**	***40***	**10**	**13**	**10**	**10**	***43***
8:45 AM	3	7	1	1	*12*	28	9	5	4	*46*	16	10	8	13	*47*
Count Total	21	27	38	28	*114*	169	27	31	14	*241*	87	73	45	59	*264*
Peak Hour	**14**	**15**	**15**	**15**	***59***	**108**	**17**	**20**	**7**	***152***	**45**	**40**	**25**	**30**	***140***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	17th St Eastbound				17th St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	0	1	0	2	7	1	0	0	5	0	17	0
7:15 AM	0	0	0	0	0	2	0	0	0	0	4	0	0	0	5	0	11	0
7:30 AM	0	1	2	0	0	1	1	0	0	1	6	1	0	0	2	0	15	0
7:45 AM	**0**	**3**	**3**	**1**	**0**	**1**	**4**	**1**	**0**	**0**	**3**	**0**	**0**	**2**	**2**	**2**	**22**	65
8:00 AM	**0**	**0**	**2**	**1**	**0**	**2**	**1**	**2**	**0**	**0**	**3**	**1**	**0**	**0**	**2**	**1**	**15**	63
8:15 AM	**0**	**1**	**1**	**0**	**0**	**1**	**2**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**2**	**0**	**10**	62
8:30 AM	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**4**	**0**	**12**	**59**
8:45 AM	0	0	3	0	0	1	6	0	0	0	1	0	0	0	1	0	12	49
Count Total	0	5	14	2	0	9	14	4	0	4	31	3	0	2	23	3	114	0
Peak Hour	**0**	**4**	**8**	**2**	**0**	**5**	**7**	**3**	**0**	**1**	**13**	**1**	**0**	**2**	**10**	**3**	**59**	**0**

Two-Hour Count Summaries - Bikes

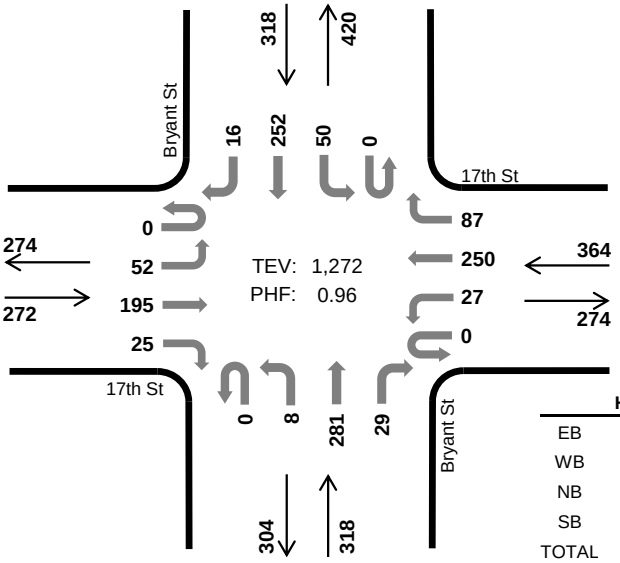
Interval Start	17th St Eastbound			17th St Westbound			Bryant St Northbound			Bryant St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	4	0	0	1	0	0	1	0	0	0	0	6	0
7:15 AM	2	9	0	0	0	0	0	0	0	0	0	1	12	0
7:30 AM	0	18	0	0	0	0	1	4	0	0	1	1	25	0
7:45 AM	**0**	**31**	**0**	**0**	**2**	**0**	**0**	**2**	**1**	**0**	**1**	**0**	**37**	80
8:00 AM	**1**	**22**	**0**	**0**	**5**	**1**	**1**	**3**	**1**	**0**	**2**	**0**	**36**	110
8:15 AM	**0**	**27**	**0**	**1**	**5**	**1**	**0**	**2**	**0**	**0**	**3**	**0**	**39**	137
8:30 AM	**0**	**25**	**2**	**0**	**2**	**0**	**0**	**10**	**0**	**0**	**1**	**0**	**40**	**152**
8:45 AM	3	25	0	1	6	2	0	3	2	0	3	1	46	161
Count Total	6	161	2	2	21	4	2	25	4	0	11	3	241	0
Peak Hour	**1**	**105**	**2**	**1**	**14**	**2**	**1**	**17**	**2**	**0**	**7**	**0**	**152**	**0**

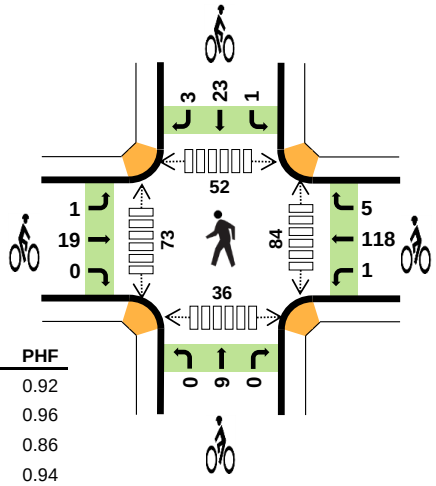
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Bryant St
17th St

Peak Hour

Date: 05-31-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	2.6%	0.92
WB	1.1%	0.96
NB	2.8%	0.86
SB	3.5%	0.94
TOTAL	2.4%	0.96

Two-Hour Count Summaries

Interval Start		17th St Eastbound				17th St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	18	59	9	0	12	59	14	1	0	81	3	0	7	46	4	313	0
4:15 PM		0	15	45	3	0	7	41	12	0	5	92	6	0	10	48	6	290	0
4:30 PM		0	12	45	8	0	2	58	25	0	3	80	2	0	8	56	4	303	0
4:45 PM		0	12	46	5	0	5	54	17	0	4	73	7	0	7	61	5	296	1,202
5:00 PM		**0**	**13**	**55**	**6**	**0**	**5**	**63**	**25**	**0**	**2**	**69**	**7**	**0**	**13**	**64**	**2**	**324**	1,213
5:15 PM		**0**	**14**	**49**	**7**	**0**	**6**	**64**	**25**	**0**	**3**	**82**	**7**	**0**	**16**	**56**	**2**	**331**	1,254
5:30 PM		**0**	**13**	**42**	**7**	**0**	**12**	**52**	**21**	**0**	**2**	**65**	**7**	**0**	**8**	**67**	**5**	**301**	1,252
5:45 PM		**0**	**12**	**49**	**5**	**0**	**4**	**71**	**16**	**0**	**1**	**65**	**8**	**0**	**13**	**65**	**7**	**316**	**1,272**
Count Total		0	109	390	50	0	53	462	155	1	20	607	47	0	82	463	35	2,474	0
Peak Hour	**All**	**0**	**52**	**195**	**25**	**0**	**27**	**250**	**87**	**0**	**8**	**281**	**29**	**0**	**50**	**252**	**16**	**1,272**	**0**
	HV	**0**	**0**	**5**	**2**	**0**	**2**	**0**	**2**	**0**	**0**	**8**	**1**	**0**	**5**	**6**	**0**	**31**	**0**
	HV%	**-**	**0%**	**3%**	**8%**	**-**	**7%**	**0%**	**2%**	**-**	**0%**	**3%**	**3%**	**-**	**10%**	**2%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	2	2	2	*9*	5	6	3	1	*15*	19	17	7	6	*49*
4:15 PM	4	3	2	2	*11*	1	13	4	4	*22*	21	11	14	9	*55*
4:30 PM	2	1	2	3	*8*	0	11	0	3	*14*	13	17	6	5	*41*
4:45 PM	0	3	2	1	*6*	3	16	1	0	*20*	9	20	12	12	*53*
5:00 PM	**4**	**2**	**2**	**2**	***10***	**4**	**18**	**2**	**5**	***29***	**21**	**19**	**7**	**8**	*55*
5:15 PM	**1**	**0**	**3**	**3**	***7***	**6**	**33**	**4**	**9**	***52***	**13**	**15**	**15**	**11**	*54*
5:30 PM	**2**	**1**	**1**	**2**	***6***	**1**	**31**	**2**	**6**	***40***	**29**	**27**	**16**	**16**	*88*
5:45 PM	**0**	**1**	**3**	**4**	***8***	**9**	**42**	**1**	**7**	***59***	**21**	**12**	**14**	**1**	***48***
Count Total	16	13	17	19	*65*	29	170	17	35	*251*	146	138	91	68	*443*
Peak Hour	**7**	**4**	**9**	**11**	***31***	**20**	**124**	**9**	**27**	***180***	**84**	**73**	**52**	**36**	***245***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	17th St Eastbound				17th St Westbound				Bryant St Northbound				Bryant St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	2	0	0	2	0	0	0	2	0	0	0	2	0	9	0
4:15 PM	0	0	3	1	0	0	2	1	0	0	2	0	0	1	0	1	11	0
4:30 PM	0	0	2	0	0	0	0	1	0	0	2	0	0	1	2	0	8	0
4:45 PM	0	0	0	0	0	0	3	0	0	0	2	0	0	0	1	0	6	34
5:00 PM	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**10**	35
5:15 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**3**	**0**	**0**	**7**	31
5:30 PM	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**6**	29
5:45 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**3**	**0**	**8**	**31**
Count Total	0	0	11	5	0	2	7	4	0	0	16	1	0	7	11	1	65	0
Peak Hour	**0**	**0**	**5**	**2**	**0**	**2**	**0**	**2**	**0**	**0**	**8**	**1**	**0**	**5**	**6**	**0**	**31**	**0**

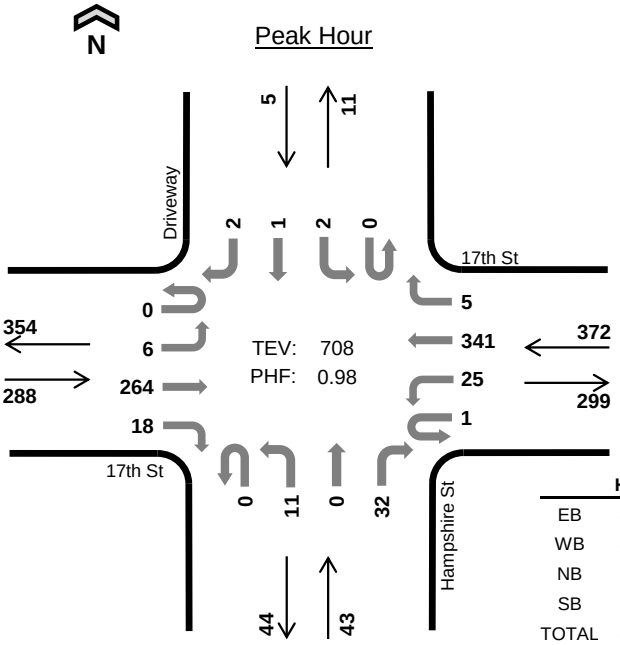
Two-Hour Count Summaries - Bikes

Interval Start	17th St Eastbound			17th St Westbound			Bryant St Northbound			Bryant St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	4	1	0	5	1	0	2	1	0	1	0	15	0
4:15 PM	0	1	0	0	13	0	0	3	1	0	2	2	22	0
4:30 PM	0	0	0	1	10	0	0	0	0	0	2	1	14	0
4:45 PM	0	3	0	0	16	0	0	1	0	0	0	0	20	71
5:00 PM	**1**	**3**	**0**	**1**	**15**	**2**	**0**	**2**	**0**	**0**	**5**	**0**	**29**	85
5:15 PM	**0**	**6**	**0**	**0**	**32**	**1**	**0**	**4**	**0**	**1**	**7**	**1**	**52**	115
5:30 PM	**0**	**1**	**0**	**0**	**31**	**0**	**0**	**2**	**0**	**0**	**4**	**2**	**40**	141
5:45 PM	**0**	**9**	**0**	**0**	**40**	**2**	**0**	**1**	**0**	**0**	**7**	**0**	**59**	**180**
Count Total	1	27	1	2	162	6	0	15	2	1	28	6	251	0
Peak Hour	**1**	**19**	**0**	**1**	**118**	**5**	**0**	**9**	**0**	**1**	**23**	**3**	**180**	**0**

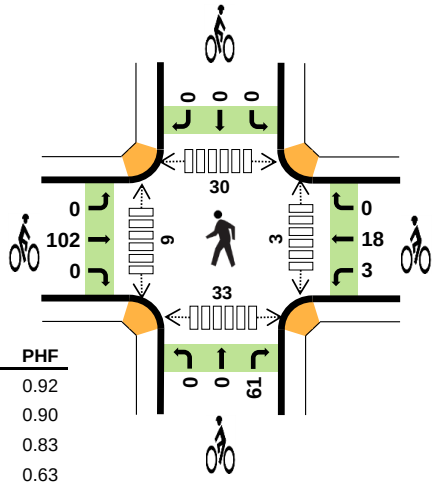
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hampshire St
17th St

Date: 05-31-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	4.5%	0.92
WB	4.6%	0.90
NB	2.3%	0.83
SB	0.0%	0.63
TOTAL	4.4%	0.98



Two-Hour Count Summaries

Interval Start	17th St Eastbound				17th St Westbound				Hampshire St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	27	2	0	7	84	0	0	4	0	2	0	1	0	0	127	0
7:15 AM	0	1	38	1	0	2	60	1	0	1	0	5	0	0	0	0	109	0
7:30 AM	0	1	57	3	0	3	82	1	0	1	0	7	0	0	0	0	155	0
7:45 AM	**0**	**1**	**55**	**5**	**0**	**6**	**96**	**1**	**0**	**3**	**0**	**10**	**0**	**1**	**0**	**1**	**179**	570
8:00 AM	**0**	**4**	**68**	**2**	**0**	**8**	**89**	**2**	**0**	**1**	**0**	**4**	**0**	**0**	**1**	**1**	**180**	623
8:15 AM	**0**	**0**	**72**	**6**	**1**	**4**	**77**	**1**	**0**	**3**	**0**	**9**	**0**	**0**	**0**	**0**	**173**	687
8:30 AM	**0**	**1**	**69**	**5**	**0**	**7**	**79**	**1**	**0**	**4**	**0**	**9**	**0**	**1**	**0**	**0**	**176**	**708**
8:45 AM	0	0	55	3	0	5	87	1	1	3	3	10	0	0	0	0	168	697
Count Total	0	8	441	27	1	42	654	8	1	20	3	56	0	3	1	2	1,267	0
Peak Hour All	**0**	**6**	**264**	**18**	**1**	**25**	**341**	**5**	**0**	**11**	**0**	**32**	**0**	**2**	**1**	**2**	**708**	**0**
Peak Hour HV	**0**	**0**	**12**	**1**	**0**	**1**	**16**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**31**	**0**
Peak Hour HV%	**-**	**0%**	**5%**	**6%**	**0%**	**4%**	**5%**	**0%**	**-**	**0%**	**-**	**3%**	**-**	**0%**	**0%**	**0%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	1	0	0	*3*	6	2	3	0	*11*	0	0	3	4	*7*
7:15 AM	1	3	0	0	*4*	10	7	4	0	*21*	2	3	8	0	*13*
7:30 AM	3	3	0	0	*6*	23	1	5	0	*29*	0	3	1	8	*12*
7:45 AM	**5**	**7**	**0**	**0**	***12***	**32**	**2**	**13**	**0**	***47***	**0**	**3**	**6**	**4**	*13*
8:00 AM	**4**	**6**	**0**	**0**	***10***	**22**	**7**	**10**	**0**	***39***	**2**	**1**	**5**	**3**	*11*
8:15 AM	**1**	**3**	**0**	**0**	***4***	**25**	**9**	**18**	**0**	***52***	**1**	**2**	**9**	**13**	*25*
8:30 AM	**3**	**1**	**1**	**0**	***5***	**23**	**3**	**20**	**0**	***46***	**0**	**3**	**10**	**13**	***26***
8:45 AM	3	8	0	0	*11*	26	11	17	0	*54*	1	3	11	16	*31*
Count Total	22	32	1	0	*55*	167	42	90	0	*299*	6	18	53	61	*138*
Peak Hour	**13**	**17**	**1**	**0**	***31***	**102**	**21**	**61**	**0**	***184***	**3**	**9**	**30**	**33**	***75***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	17th St Eastbound				17th St Westbound				Hampshire St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0
7:15 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0
7:30 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	6	0
7:45 AM	**0**	**0**	**5**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	25
8:00 AM	**0**	**0**	**4**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	32
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	32
8:30 AM	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**31**
8:45 AM	0	0	3	0	0	0	8	0	0	0	0	0	0	0	0	0	11	30
Count Total	0	0	21	1	0	1	31	0	0	0	0	1	0	0	0	0	55	0
Peak Hour	**0**	**0**	**12**	**1**	**0**	**1**	**16**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**31**	**0**

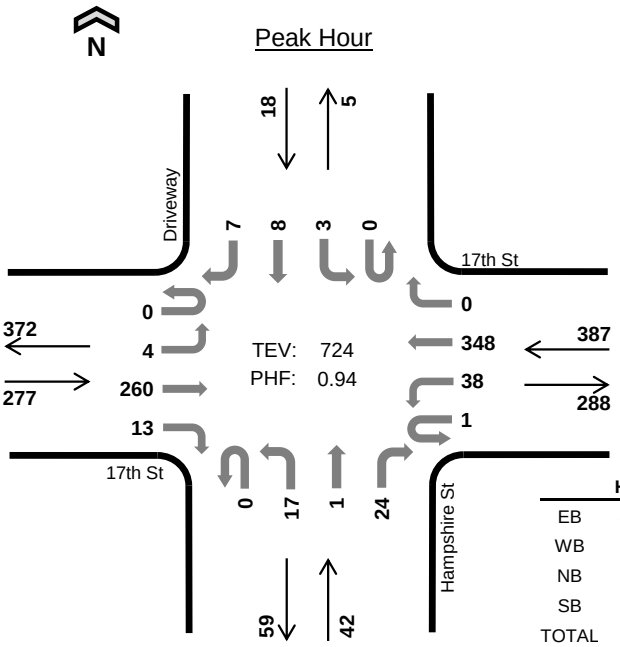
Two-Hour Count Summaries - Bikes

Interval Start	17th St Eastbound			17th St Westbound			Hampshire St Northbound			Driveway Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	5	1	1	1	0	0	0	3	0	0	0	11	0
7:15 AM	0	10	0	0	7	0	0	0	4	0	0	0	21	0
7:30 AM	0	22	1	0	1	0	0	0	5	0	0	0	29	0
7:45 AM	**0**	**32**	**0**	**0**	**2**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**47**	108
8:00 AM	**0**	**22**	**0**	**1**	**6**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**39**	136
8:15 AM	**0**	**25**	**0**	**2**	**7**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**52**	167
8:30 AM	**0**	**23**	**0**	**0**	**3**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**46**	**184**
8:45 AM	0	26	0	2	9	0	0	0	17	0	0	0	54	191
Count Total	0	165	2	6	36	0	0	0	90	0	0	0	299	0
Peak Hour	**0**	**102**	**0**	**3**	**18**	**0**	**0**	**0**	**61**	**0**	**0**	**0**	**184**	**0**

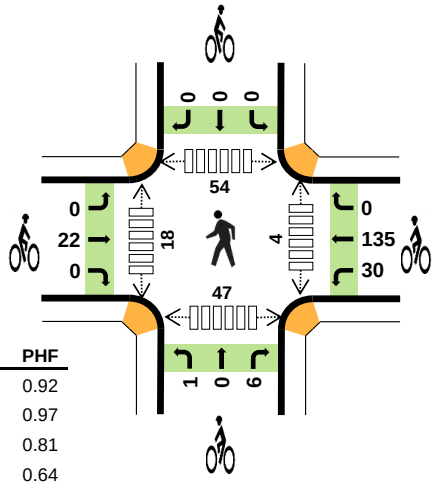
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hampshire St
17th St

Date: 05-31-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	4.0%	0.92
WB	0.8%	0.97
NB	0.0%	0.81
SB	0.0%	0.64
TOTAL	1.9%	0.94



Two-Hour Count Summaries

Interval Start	17th St Eastbound				17th St Westbound				Hampshire St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	65	4	0	2	81	0	0	5	0	1	0	0	1	2	161	0
4:15 PM	0	1	59	2	1	4	57	0	0	1	1	5	0	2	0	0	133	0
4:30 PM	0	0	48	5	0	13	78	0	0	5	0	7	0	0	1	3	160	0
4:45 PM	0	0	57	3	0	8	67	0	0	3	2	10	0	0	2	0	152	606
5:00 PM	**0**	**1**	**70**	**4**	**0**	**7**	**92**	**0**	**0**	**6**	**0**	**7**	**0**	**1**	**2**	**2**	**192**	637
5:15 PM	**0**	**0**	**68**	**2**	**1**	**8**	**87**	**0**	**0**	**6**	**0**	**5**	**0**	**0**	**1**	**0**	**178**	682
5:30 PM	**0**	**1**	**55**	**1**	**0**	**15**	**85**	**0**	**0**	**4**	**1**	**7**	**0**	**1**	**5**	**1**	**176**	698
5:45 PM	**0**	**2**	**67**	**6**	**0**	**8**	**84**	**0**	**0**	**1**	**0**	**5**	**0**	**1**	**0**	**4**	**178**	**724**
Count Total	0	5	489	27	2	65	631	0	0	31	4	47	0	5	12	12	1,330	0
Peak Hour All	**0**	**4**	**260**	**13**	**1**	**38**	**348**	**0**	**0**	**17**	**1**	**24**	**0**	**3**	**8**	**7**	**724**	**0**
Peak Hour HV	**0**	**0**	**11**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**
Peak Hour HV%	**-**	**0%**	**4%**	**0%**	**0%**	**0%**	**1%**	**-**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	3	0	0	*4*	4	9	1	0	*14*	1	3	7	4	*15*
4:15 PM	4	3	0	0	*7*	2	13	1	0	*16*	1	1	10	11	*23*
4:30 PM	3	2	0	0	*5*	2	14	0	0	*16*	1	5	15	8	*29*
4:45 PM	0	3	0	0	*3*	3	19	1	0	*23*	1	2	5	7	*15*
5:00 PM	**4**	**2**	**0**	**0**	***6***	**3**	**25**	**2**	**0**	***30***	**2**	**2**	**7**	**10**	*21*
5:15 PM	**4**	**0**	**0**	**0**	***4***	**7**	**43**	**2**	**0**	***52***	**1**	**2**	**15**	**14**	*32*
5:30 PM	**2**	**1**	**0**	**0**	***3***	**1**	**41**	**0**	**0**	***42***	**0**	**8**	**18**	**11**	*37*
5:45 PM	**1**	**0**	**0**	**0**	***1***	**11**	**56**	**3**	**0**	***70***	**1**	**6**	**14**	**12**	***33***
Count Total	19	14	0	0	*33*	33	220	10	0	*263*	8	29	91	77	*205*
Peak Hour	**11**	**3**	**0**	**0**	***14***	**22**	**165**	**7**	**0**	***194***	**4**	**18**	**54**	**47**	***123***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	17th St Eastbound				17th St Westbound				Hampshire St Northbound				Driveway Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0
4:15 PM	0	0	4	0	0	1	2	0	0	0	0	0	0	0	0	0	7	0
4:30 PM	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	5	0
4:45 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	19
5:00 PM	**0**	**0**	**4**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	21
5:15 PM	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	18
5:30 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	16
5:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**14**
Count Total	0	0	19	0	0	2	12	0	0	0	0	0	0	0	0	0	33	0
Peak Hour	**0**	**0**	**11**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	17th St Eastbound			17th St Westbound			Hampshire St Northbound			Driveway Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	4	0	1	8	0	0	0	1	0	0	0	14	0
4:15 PM	0	2	0	1	12	0	0	0	1	0	0	0	16	0
4:30 PM	0	2	0	3	11	0	0	0	0	0	0	0	16	0
4:45 PM	0	3	0	3	16	0	0	0	1	0	0	0	23	69
5:00 PM	**0**	**3**	**0**	**8**	**17**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**30**	85
5:15 PM	**0**	**7**	**0**	**5**	**38**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**52**	121
5:30 PM	**0**	**1**	**0**	**7**	**34**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**42**	147
5:45 PM	**0**	**11**	**0**	**10**	**46**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**70**	**194**
Count Total	0	33	0	38	182	0	1	0	9	0	0	0	263	0
Peak Hour	**0**	**22**	**0**	**30**	**135**	**0**	**1**	**0**	**6**	**0**	**0**	**0**	**194**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

	LOCATION: D1					
	Autos		Buses		Trucks	
Time	IN	OUT	IN	OUT	IN	OUT
0:00	0	0	0	0	0	0
0:15	0	0	0	0	0	0
0:30	0	2	0	0	0	0
0:45	0	0	0	0	0	0
1:00	0	2	0	0	0	0
1:15	0	3	0	0	0	0
1:30	2	2	0	0	0	0
1:45	0	3	0	0	0	0
2:00	2	1	0	0	0	0
2:15	1	3	0	0	0	0
2:30	0	0	0	0	0	0
2:45	3	2	0	0	0	0
3:00	0	1	0	0	0	0
3:15	5	1	0	0	0	0
3:30	6	0	0	0	0	0
3:45	7	2	0	0	0	0
4:00	2	2	0	0	1	1
4:15	3	0	0	1	0	0
4:30	7	1	0	1	0	0
4:45	2	4	0	0	0	0
5:00	3	0	0	0	0	0
5:15	8	6	1	1	0	0
5:30	7	4	0	0	0	0
5:45	4	4	0	0	0	0
6:00	9	10	0	0	0	0
6:15	3	3	0	3	0	0
6:30	1	1	0	2	0	0
6:45	9	2	0	0	0	0
7:00	2	4	0	0	0	0
7:15	1	0	0	0	0	0
7:30	0	1	0	0	0	0
7:45	1	0	0	0	0	0
8:00	1	0	0	0	0	0
8:15	2	1	0	0	0	0
8:30	1	1	0	1	0	0
8:45	0	0	0	0	0	0
9:00	2	0	0	0	0	0
9:15	2	0	0	1	0	0
9:30	0	1	0	0	0	0
9:45	1	2	0	0	0	0
10:00	1	1	0	0	0	0
10:15	2	3	0	0	0	0
10:30	4	2	0	0	0	0
10:45	6	5	0	0	1	0
11:00	2	6	0	0	0	0
11:15	3	4	0	0	0	0
11:30	5	1	0	0	0	0
11:45	3	3	0	0	0	0
12:00	3	4	0	0	0	0
12:15	6	2	0	0	0	0
12:30	2	4	0	0	0	0
12:45	4	3	0	0	0	0
13:00	1	12	0	0	0	0
13:15	3	2	0	0	0	0
13:30	1	1	0	0	0	0
13:45	2	1	0	0	0	1
14:00	3	3	0	0	0	0
14:15	4	3	0	0	0	0
14:30	1	2	0	0	0	0
14:45	4	4	0	0	0	0
15:00	1	3	0	0	0	0
15:15	1	3	0	0	0	0
15:30	2	5	0	0	0	0
15:45	2	2	0	0	0	0
16:00	2	1	0	0	0	0
16:15	0	1	0	0	0	0
16:30	0	2	0	0	0	0
16:45	1	2	0	0	0	0
17:00	1	1	0	0	0	0
17:15	0	1	0	0	0	0
17:30	0	0	0	0	0	0
17:45	0	2	0	0	0	0
18:00	0	1	3	0	0	0
18:15	0	0	3	0	0	0
18:30	2	1	4	0	0	0
18:45	0	0	0	0	0	0

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

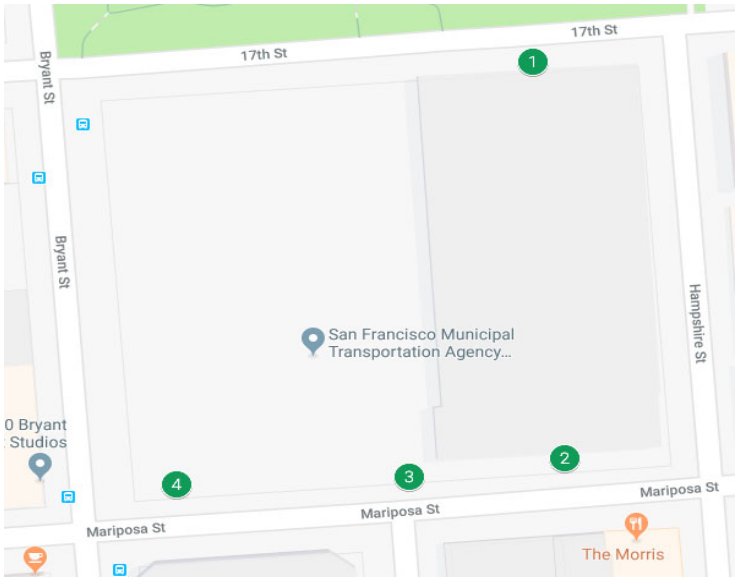
	LOCATION: D2					
	Autos		Buses		Trucks	
Time	IN	OUT	IN	OUT	IN	OUT
0:00	0	0	0	0	0	0
0:15	0	0	0	0	0	0
0:30	0	0	0	0	0	0
0:45	0	0	0	1	0	0
1:00	0	0	0	2	0	0
1:15	0	0	0	0	0	0
1:30	0	0	0	1	0	0
1:45	0	0	0	0	0	0
2:00	0	0	0	0	0	0
2:15	0	0	0	0	0	0
2:30	0	0	0	0	0	0
2:45	0	0	0	0	0	0
3:00	0	1	0	0	0	0
3:15	0	0	0	0	0	0
3:30	0	0	0	0	1	0
3:45	0	0	0	0	0	0
4:00	0	0	0	0	0	0
4:15	0	0	0	0	0	0
4:30	0	0	0	0	0	0
4:45	0	0	0	1	0	0
5:00	0	0	0	1	0	0
5:15	0	0	0	4	0	0
5:30	0	0	0	4	0	0
5:45	0	0	0	6	0	0
6:00	0	0	0	2	0	0
6:15	0	0	0	2	0	1
6:30	0	0	0	0	0	0
6:45	0	0	0	5	0	0
7:00	0	0	0	1	0	0
7:15	0	0	0	2	0	0
7:30	0	0	1	1	0	0
7:45	0	0	0	1	0	0
8:00	0	0	0	0	0	0
8:15	2	1	0	0	0	0
8:30	1	2	0	0	0	0
8:45	0	0	0	1	0	0
9:00	0	0	0	0	0	0
9:15	0	0	0	0	0	0
9:30	0	0	0	1	0	0
9:45	0	0	0	2	0	0
10:00	0	0	0	3	0	0
10:15	0	0	0	4	0	0
10:30	0	0	0	0	0	0
10:45	0	0	0	3	0	0
11:00	0	0	0	1	0	0
11:15	0	0	0	0	0	0
11:30	0	0	0	0	0	0
11:45	0	0	0	0	0	0
12:00	0	0	0	0	0	0
12:15	1	1	0	0	0	0
12:30	0	0	0	0	0	0
12:45	1	1	0	0	0	0
13:00	0	0	0	0	0	0
13:15	0	0	0	0	0	0
13:30	0	0	0	0	0	0
13:45	0	0	0	1	0	1
14:00	0	0	0	0	0	0
14:15	0	0	0	0	0	0
14:30	0	0	0	0	0	0
14:45	0	0	0	0	0	0
15:00	0	0	0	3	0	0
15:15	1	1	0	0	0	0
15:30	0	0	0	3	0	0
15:45	0	0	0	3	0	0
16:00	0	0	0	1	0	0
16:15	0	0	0	0	0	0
16:30	0	0	0	0	0	0
16:45	0	0	0	0	0	0
17:00	0	0	0	0	0	0
17:15	0	0	0	0	0	0
17:30	0	0	0	0	0	0
17:45	0	0	0	0	0	0
18:00	0	0	0	0	0	0
18:15	0	0	0	0	0	0
18:30	0	0	0	0	0	0
18:45	0	0	0	0	0	0

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

	LOCATION: D1						
	Autos		Buses		Trucks		
Time	IN	OUT	IN	OUT	IN	OUT	
19:00	1	2	0	0	0	0	
19:15	1	1	0	0	0	0	
19:30	0	1	0	0	0	0	
19:45	2	3	0	0	0	0	
20:00	2	3	0	0	0	0	
20:15	1	2	0	0	0	0	
20:30	4	3	0	0	0	0	
20:45	2	2	0	0	0	0	
21:00	2	3	0	0	0	0	
21:15	0	1	0	0	0	0	
21:30	2	1	0	0	0	0	
21:45	1	0	0	0	0	0	
22:00	0	2	0	0	0	0	
22:15	1	3	0	0	0	0	
22:30	0	1	0	0	0	0	
22:45	1	1	0	0	0	0	
23:00	0	2	0	0	0	0	
23:15	2	0	0	0	0	0	
23:30	0	0	0	1	0	0	
23:45	1	2	0	0	0	0	
TOTAL IN	192		11		2		205
TOTAL OUT		193		11		2	206

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

	LOCATION: D2						
	Autos		Buses		Trucks		
Time	IN	OUT	IN	OUT	IN	OUT	
19:00	0	0	0	1	0	0	
19:15	0	0	0	0	0	0	
19:30	0	0	0	0	0	0	
19:45	0	0	0	0	0	0	
20:00	0	0	0	0	0	0	
20:15	0	0	0	0	0	0	
20:30	0	0	0	0	0	0	
20:45	0	0	0	0	0	0	
21:00	0	0	0	0	0	0	
21:15	0	0	0	4	0	0	
21:30	0	0	0	2	1	0	
21:45	0	0	0	0	0	0	
22:00	0	0	0	2	0	0	
22:15	0	0	0	1	0	0	
22:30	0	0	0	0	0	0	
22:45	0	0	0	0	0	1	
23:00	0	0	0	0	0	0	
23:15	0	0	0	0	1	0	
23:30	0	0	0	0	0	0	
23:45	0	0	0	0	0	0	
TOTAL IN	0	0	0	0	0	0	0
TOTAL OUT		7		70		3	80



SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

	LOCATION: D3					
	Autos		Buses		Trucks	
Time	IN	OUT	IN	OUT	IN	OUT
0:00	0	0	0	0	0	0
0:15	1	1	2	0	0	0
0:30	0	1	4	0	0	0
0:45	0	0	2	0	0	0
1:00	1	0	3	0	0	0
1:15	0	0	5	0	0	0
1:30	0	1	4	0	0	0
1:45	0	1	0	0	1	1
2:00	0	0	2	0	0	0
2:15	1	0	0	0	0	0
2:30	0	0	1	0	0	0
2:45	0	1	1	0	0	0
3:00	2	1	0	0	0	0
3:15	0	0	0	0	0	0
3:30	1	1	0	0	0	0
3:45	2	0	0	0	0	0
4:00	1	0	0	0	0	0
4:15	0	0	0	0	0	0
4:30	0	0	0	0	0	0
4:45	2	1	0	0	0	0
5:00	2	0	1	0	0	0
5:15	3	0	1	0	0	0
5:30	7	1	2	0	0	0
5:45	18	1	2	0	0	0
6:00	0	1	2	0	0	0
6:15	0	0	1	0	0	0
6:30	0	3	0	0	0	0
6:45	2	0	0	0	0	0
7:00	0	1	0	0	0	0
7:15	0	0	1	0	0	0
7:30	1	0	1	0	1	0
7:45	0	1	0	0	0	0
8:00	1	0	0	0	0	0
8:15	0	0	0	0	0	0
8:30	2	0	2	0	0	0
8:45	1	1	1	0	1	0
9:00	1	1	0	0	0	0
9:15	0	0	2	0	0	0
9:30	2	1	2	0	0	0
9:45	0	1	3	0	0	0
10:00	1	0	4	0	0	0
10:15	0	0	2	0	0	0
10:30	0	0	2	0	0	0
10:45	0	1	1	0	1	0
11:00	2	0	1	0	0	0
11:15	0	0	1	0	0	0
11:30	2	2	1	0	0	0
11:45	2	0	0	0	0	0
12:00	2	2	0	0	0	0
12:15	3	0	0	0	0	0
12:30	2	3	0	0	0	0
12:45	2	1	1	0	0	0
13:00	2	1	0	0	0	0
13:15	0	2	0	0	1	0
13:30	1	0	3	0	0	0
13:45	2	0	1	0	0	0
14:00	1	0	0	0	0	0
14:15	0	0	0	0	0	0
14:30	1	13	1	0	0	0
14:45	0	1	0	0	0	0
15:00	1	1	1	0	0	1
15:15	1	0	3	0	0	0
15:30	0	1	3	0	0	0
15:45	0	0	1	0	0	0
16:00	0	0	0	0	0	0
16:15	0	0	0	0	0	0
16:30	0	0	0	0	0	0
16:45	0	0	0	0	0	0
17:00	0	0	0	0	0	0
17:15	0	0	0	0	0	0
17:30	1	0	1	0	1	0
17:45	0	0	2	0	0	0
18:00	2	0	1	0	0	0
18:15	0	1	0	0	0	0
18:30	2	1	1	0	0	0
18:45	0	0	5	0	0	0

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

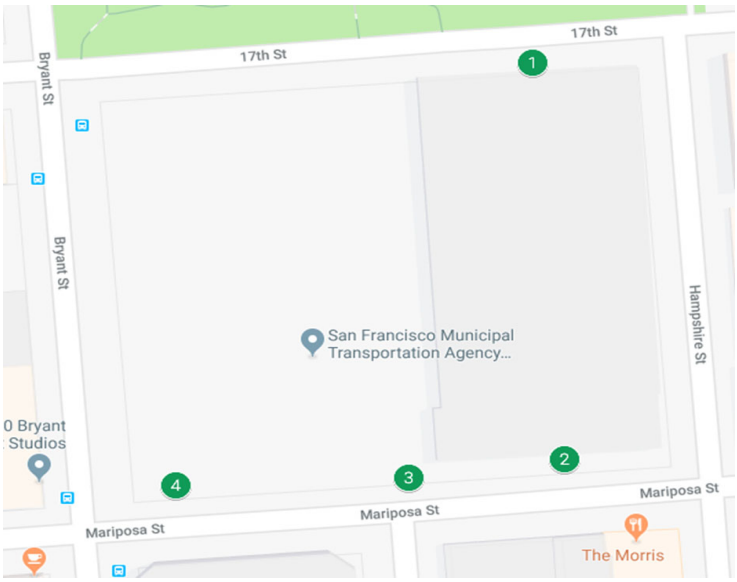
	LOCATION: D4					
	Autos		Buses		Trucks	
Time	IN	OUT	IN	OUT	IN	OUT
0:00	0	0	0	0	0	0
0:15	0	0	0	0	0	0
0:30	0	0	0	0	0	0
0:45	0	0	0	0	0	0
1:00	0	0	0	0	0	0
1:15	0	0	0	0	0	0
1:30	0	0	0	0	0	0
1:45	0	0	0	0	0	0
2:00	0	0	0	0	0	0
2:15	0	0	0	0	0	0
2:30	0	0	0	0	0	0
2:45	0	0	0	0	0	0
3:00	0	0	0	0	0	0
3:15	0	0	0	0	0	0
3:30	0	0	0	0	0	0
3:45	0	0	0	1	0	0
4:00	0	0	0	0	0	0
4:15	1	0	0	1	0	0
4:30	0	0	0	1	0	0
4:45	0	0	0	5	0	0
5:00	1	0	0	3	0	0
5:15	1	1	0	3	0	0
5:30	0	2	0	3	0	0
5:45	1	0	0	5	0	0
6:00	0	1	0	5	0	0
6:15	0	0	0	4	0	0
6:30	0	4	0	2	0	0
6:45	0	2	0	2	0	0
7:00	0	4	0	5	0	0
7:15	0	1	0	2	0	0
7:30	0	0	0	3	0	0
7:45	0	0	0	1	0	1
8:00	1	0	0	1	0	0
8:15	0	1	0	0	0	0
8:30	0	0	0	1	0	0
8:45	0	1	0	0	0	0
9:00	1	0	0	2	0	0
9:15	0	0	0	0	0	1
9:30	1	1	0	2	0	0
9:45	0	1	0	0	0	0
10:00	1	0	0	0	1	0
10:15	1	2	0	0	0	0
10:30	0	1	0	2	0	1
10:45	0	1	0	1	0	0
11:00	1	2	0	0	0	0
11:15	0	2	0	0	0	0
11:30	0	2	0	1	0	0
11:45	0	0	0	1	0	0
12:00	0	0	0	0	0	1
12:15	0	0	0	0	0	0
12:30	1	1	0	0	0	0
12:45	0	3	0	0	0	0
13:00	1	0	0	0	0	0
13:15	0	0	0	0	0	0
13:30	1	2	0	0	0	0
13:45	0	2	0	1	0	0
14:00	0	1	0	0	0	0
14:15	2	1	0	0	0	0
14:30	0	11	0	0	0	0
14:45	0	2	0	0	0	0
15:00	0	1	0	0	0	0
15:15	0	0	0	0	0	1
15:30	0	0	0	0	0	0
15:45	0	0	0	0	0	0
16:00	0	0	0	0	0	0
16:15	0	0	0	0	0	0
16:30	0	0	0	0	0	0
16:45	0	0	0	0	0	0
17:00	0	0	0	0	0	0
17:15	0	0	0	0	0	0
17:30	0	0	0	0	0	0
17:45	0	0	0	0	0	0
18:00	0	2	0	0	0	0
18:15	0	0	0	0	0	0
18:30	0	0	0	0	0	0
18:45	0	1	0	0	0	0

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

	LOCATION: D3						
	Autos		Buses		Trucks		
Time	IN	OUT	IN	OUT	IN	OUT	
19:00	0	1	5	0	0	0	
19:15	0	0	4	0	0	0	
19:30	0	0	7	0	0	0	
19:45	0	0	6	0	0	0	
20:00	0	0	6	0	0	0	
20:15	1	0	5	0	0	0	
20:30	0	0	6	0	0	0	
20:45	0	0	3	0	0	0	
21:00	0	0	1	0	0	0	
21:15	0	0	3	0	0	1	
21:30	1	0	3	0	0	0	
21:45	4	0	1	0	0	0	
22:00	2	0	3	0	0	0	
22:15	2	0	3	0	0	0	
22:30	1	5	2	0	0	0	
22:45	0	0	3	0	0	0	
23:00	0	0	1	0	0	0	
23:15	0	1	0	0	0	0	
23:30	0	0	3	0	0	0	
23:45	1	1	1	0	0	0	
TOTAL IN	93		147		6		246
TOTAL OUT		58		0		3	61

SF - Mariposa St Counts
DRIVEWAY IN'S AND OUT'S
IDAX Data Solutions
5/31/2018

	LOCATION: D4						
	Autos		Buses		Trucks		
Time	IN	OUT	IN	OUT	IN	OUT	
19:00	0	0	0	0	0	0	
19:15	0	0	0	0	0	0	
19:30	0	0	0	0	0	0	
19:45	0	0	0	0	0	0	
20:00	0	0	0	0	0	0	
20:15	0	0	0	0	0	0	
20:30	0	0	0	0	0	0	
20:45	0	0	0	0	0	0	
21:00	0	0	0	0	0	0	
21:15	0	0	0	0	0	0	
21:30	0	0	0	0	0	0	
21:45	0	0	0	0	0	0	
22:00	0	0	0	0	0	0	
22:15	0	0	0	0	0	0	
22:30	0	0	0	0	0	0	
22:45	0	0	0	0	0	0	
23:00	0	0	0	0	0	0	
23:15	0	0	0	0	0	0	
23:30	0	0	0	0	0	0	
23:45	0	0	0	0	0	0	
TOTAL IN	15		0		1		16
TOTAL OUT		56		58		5	119



Appendix E-3

Loading and Parking Data

Potrero Yard Modernization Project EIR													
On-Street Parking and Loading Information													
		North or East Sides						**South or West Sides**					
		Parking			**Loading**		**Bus**	**Parking**			**Loading**		**Bus**
		Spaces	**Occupancy**	**Regulation**	**Spaces**	**Occupancy**	**Stop**	**Spaces**	**Occupancy**	**Regulation**	**Spaces**	**Occupancy**	**Stop**
17th Street													
Bryant	Hampshire	10	10	No Reg 1 ADA	--	--	--	--	--	--	--	--	--
Mariposa Street													
Bryant	York	6	5	No Reg	--	--	--	6	**	**	44' pass	**	--
York	Hampshire	--	--	--	--	--	--	8	7	No Reg	--	--	--
Bryant Street													
17th	Mariposa	15	15	12 Hr Limit	--	--	1	5	5	No Reg	2 yellow	1	2
											47'		
Hampshire Street													
17th	Mariposa	26	24	90*/No Reg	6 yellow	2	--	43	42	90*/12 Hr	--	--	--
					38' + 20'								
Source: LCW Consulting field surveys on March 5 , March 13 and March 14th, 2020													
Midday occupancy on March 13, 2020.													
Notes													
1.	Side of street adjacent to project site.												
2.	Two bicycle racks on the east side of Hampshire St near Little Mission Studio, and three on the south side of Mariposa St between York and Hampshire Sts.												
3.	New signal at Bryant/17th has pedestrian countdown signal, but no LPI. New signal at 17th/Harrison has an LPI.												
4.	Construction zone on south side of Mariposa Street between Bryant and York streets.												
	A 44 foot passenger zone is marked on the curb, At All Times												
5.	Commercial loading zones Monday through Friday, 7 AM to 6 PM, 30 minutes												
	Two commercial loading zones on Hampshire Street (38 feet and 20 feet) and one 47 foot commercial zone on Bryant St.												
6.	North side of 17th Street No Parking Vehicles over 22 feet long or 7 feet high, Everyday.												
7.	Some vehicles park within driveways, such as on the east side of Hampshire Street & on the west side of Bryant Street.												
8.	90-degree angle parking on both sides of Hampshire Street.												

Appendix E-4

Travel Demand Memorandum

Memorandum

Date: August 12, 2020

To: Sherie George, Planning Department, City and County of San Francisco

From: Teresa Whinery, Sarah Richardson and Bill Burton, Fehr & Peers
Luba Wyznyckyj, LCW Consulting

Subject: Travel Demand Estimates for the Potrero Yard Modernization Project – Case No. 2019-021884ENV

SF18-0972

This memorandum presents the assumptions and methodology used to develop travel demand for the proposed Potrero Yard Modernization Project at 2500 Mariposa Street in San Francisco's Mission neighborhood (herein "the proposed project"). The project site is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west.

Project travel demand refers to the new vehicle, transit, walking, and bicycling trips that would be generated by the proposed project. This memorandum describes the existing site and Potrero Yard operations, the proposed project components and land uses, and travel demand methodology and analysis results, including daily and p.m. peak hour trip generation by ways people travel, and commercial and passenger loading demand. In addition, the memorandum presents the screening assessment related to vehicle trip generation during the p.m. peak hour for the transit service delay analysis.

The travel demand analysis presented in this document is based on standard methodology and practices used in the evaluation of transportation impacts as part of environmental review in San Francisco, which are described in detail in the Transportation Impact Analysis Guidelines for

Environmental Review ("SF Guidelines")[1] prepared by the San Francisco Planning Department ("department"). Detailed travel demand calculations and supporting data are included in the attached appendices.

Summary

The proposed project, which includes two components, would demolish, modernize, and expand the existing Potrero Yard transit facility ("transit facility"). In addition, the joint-development component would develop up to 575 residential units and 33,000 square feet of commercial/retail space ("residential development").

The proposed project (including both components) would generate:

- Approximately 11,456 daily and 898 p.m. peak hour person trips by all modes of travel. This would be an increase of 10,254 daily person trips and 870 p.m. peak hour person trips over existing conditions.
- Approximately 4,456 daily and 253 p.m. peak hour vehicle trips. This would be an increase of 3,208 daily and 226 p.m. peak hour vehicle trips over existing conditions.
- Peak simultaneous loading demand for two passenger loading spaces and one commercial/freight loading space

The proposed project would not exceed the 2019 SF Guidelines' transit delay screening criteria related to vehicle trips during the p.m. peak hour, and therefore, a quantitative transit delay analysis is not required as part of the public transit impact analysis.

The employee and family support variant (including both components, and replacing 9,000 square feet of commercial space with a childcare facility) would generate:

- Approximately 10,294 daily and 849 p.m. peak hour person trips by all modes of travel. This would be an increase of 9,092 daily person trips and 821 p.m. peak hour person trips over existing conditions.

[1] San Francisco Planning Department, Transportation Impact Analysis Guidelines for Environmental Review, October 2002 and Transportation Impact Analysis Guidelines, February 2019 (Updated October 2019). Referred to in this memorandum as 2002 SF Guidelines or 2019 SF Guidelines, as appropriate.

- Approximately 4,399 daily and 305 p.m. peak hour vehicle trips. This would be an increase of 3,152 daily and 278 p.m. peak hour vehicle trips over existing conditions.
- Peak simultaneous loading demand for eight passenger loading spaces and three commercial/freight loading spaces.

Project Description

The San Francisco Municipal Transportation Agency (SFMTA), who owns the property through the City and County of San Francisco, is proposing to modernize and expand the existing Potrero Yard transit facility. In addition, the proposed project would incorporate a joint development component consisting of up to 575 residential units, of which 50 percent would be below-market rate or affordable, and 33,000 square feet of ground floor commercial/retail uses. Under the proposed project, the existing Potrero Yard facility would be demolished and replaced with a new structure of approximately 9- to 13-stories, a height range of 75- to 150-feet , and an estimated 1,300,000-gross-square- feet in area.

These two proposed project components are referred to in this memorandum as the "transit facility" and the "residential development." **Table 1** presents a summary of the existing uses on the project site and the land uses included as part of the proposed transit facility and residential development components.

Table 1: Existing and Proposed Project Land Uses

Project Component/Land Use	Existing	Proposed Project[1]	Net-New Project
Transit Facility	**221 ksf**	**723 ksf**	***~~+~~502* ksf**
Administrative & Office Space	*N/A*[1]	*52 ksf*	*+52 ksf*
Bus Maintenance & Storage	221 ksf	*576 ksf*	*+355 ksf*
Residential Development			
Residential Units	*N/A*	575 residential units 141 studios 206 1-bedrooms 194 2-bedrooms 34 3-bedrooms	+575 residential units
Commercial/Retail Uses	*N/A*	33 ksf	+33 ksf

1. The existing transit facility employs approximately 16 employees who are considered 'office-based' and contains a small amount of accessory office space. Travel patterns for these employees are captured in the bus maintenance and storage land use category based on counts at the existing site.

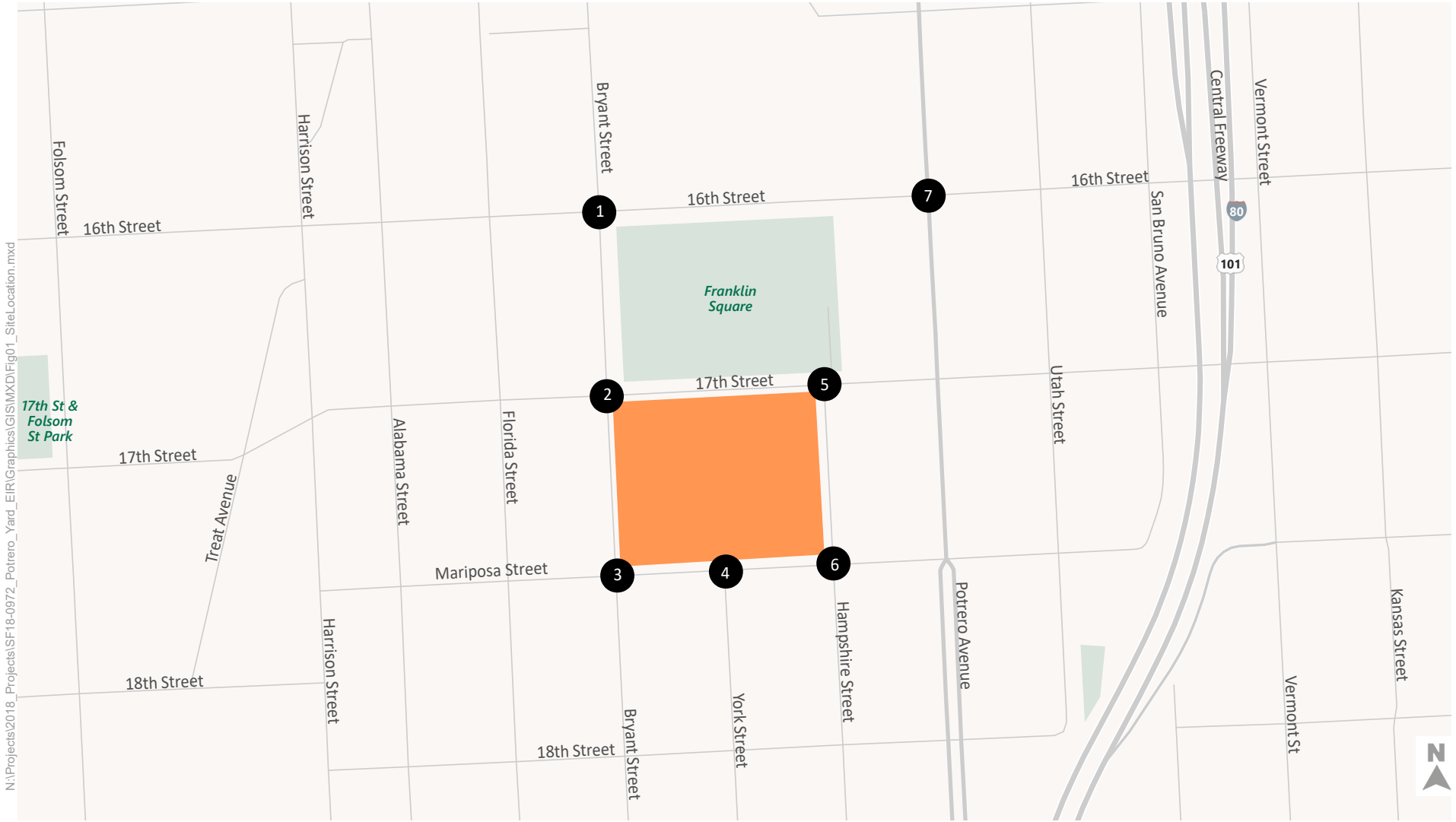
Source: SFMTA, 2020.

Existing Uses at the Project Site

The 4.4-acre property occupies roughly 2 city blocks and is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south, and Bryant Street to the west (see **Figure 1**). The existing SFMTA facility is 221,450 gross square-feet. The western half is occupied by an asphalt-paved bus storage yard, including a bus wash area and running repair station (112,450 square feet). The eastern half is occupied by the maintenance and operations building, including a second-floor parking deck (109,000 square feet). The facility was designed to accommodate 138 trolley coaches; however, the site operates at "crush" capacity[2] and currently houses and maintains 158 trolley coaches, including 65 40-foot trolley coaches and 93 60-foot trolley coaches. The storage yard also provides 56 striped parking spaces on the roof of the existing maintenance building for non-revenue vehicles and employee parking. Vehicular access is currently via 17th Street for access to the second story of the maintenance and operations building and rooftop parking (one driveway located on the northeast corner of the site), and via Mariposa Street for all other purposes (three driveways located across the site's southern frontage).

There are approximately 400 total employees, including approximately 300 bus operators, at the Potrero Yard transit facility under existing conditions.

[2] Crush capacity means that buses are parked in circulation aisles and maintenance bays.



Study Intersections

Project Site

Parks

Figure 1

Project Location

Proposed Transit Facility

The proposed three-level transit facility and all proposed transit-related administrative, service, and maintenance uses would be housed within the approximately 75-foot-tall podium of the proposed project. The proposed transit facility would include 52,000 square feet of administrative, training, and office space (e.g., offices, conference rooms, break rooms/kitchenettes, and training rooms). It would help support the administrative and training aspects of operations at the facility, and would likely operate similarly to traditional office space.

The remaining 671,000 square feet of space would include bus service, storage, and circulation space. The facility is designed to include parking for 213 trolley coaches and space for 18 maintenance bays. Employee parking for the transit facility would not be provided.

The number of employees that would be accommodated at the facility with the project would increase from approximately 400 to 829 total employees, including an increase from 309 to 383 bus operators.

Proposed Residential Development

The residential development would include between 525 and 575 residential units, of which 50 percent would be below market rate or affordable units. As a conservative assumption, 575 units were used for the travel demand estimate, including 141 studio units, 206 one-bedroom units, 194 two-bedroom units, and 34 three-bedroom units (a total of 837 bedrooms). The residential development would also include up to 33,000 square feet of ground floor commercial and active space. This use was analyzed as a general retail land use.

The residential development would not include any dedicated vehicle parking spaces for residents or visitors.

Employee and Family Support Variant

The Employee and Family Support Variant would replace 9,000 of the 33,000 square feet of commercial retail uses included in the proposed project with childcare uses, and therefore the trip generation for this variant would be different than for the proposed project. Travel demand for the Employee and Family Support Variant was estimated consistent with the methodology presented below for the proposed project, and is summarized at the end of this memorandum.

Travel Demand Analysis

The travel demand estimates were based on observed data at the existing transit facility and information contained in the 2019 SF Guidelines, as well as select data from the 2002 SF Guidelines. The data in the SF Guidelines are generally accepted as more appropriate for use in transportation impact analyses for San Francisco development projects than conventional transportation planning data because of the unique mix of uses, density, availability of transit, and cost of parking in San Francisco. In the case of the proposed project, the transit facility use is not a typical use included in the 2019 SF Guidelines data, and, as such, additional travel demand information was obtained through local field surveys and prior data from the 2002 SF Guidelines.

The travel demand model developed for the analysis of the proposed project follows. The four main steps are outlined first, followed by additional explanation. The detailed travel demand calculations for the proposed project are presented in **Appendix A**.

- **Step 1: Trip Generation**. Total person trip generation was calculated for each of the individual land uses. The person-trip generation estimates for the proposed project include residents, employees and visitors associated with the proposed land uses.
- **Step 2: Ways People Travel**. The person trips estimated in step 1 were independently allocated to ways of travel, also known as mode split, to determine the number of trips by auto/truck, taxi/TNC, transit, walk and bike. The "auto" mode includes persons traveling by private auto and carpool, as well as commercial vehicle traffic (i.e., pickup trucks and other trucks) generated by the project. The "taxi/TNC" mode includes taxis and app-based ride hailing services (e.g., Uber, Lyft), etc. The "transit" mode includes individuals traveling by local and regional public transportation.
- **Step 3: Common Origins and Destinations (Trip Distribution)**. The person and vehicle trips estimated in the previous step were then distributed to various points of trip origin or destination, inbound and outbound, for each of the project's specific land use. Specifically, the trips origins and destinations were allocated to the eight San Francisco neighborhoods and the East Bay, North Bay, and South Bay.
- **Step 4: Trip Assignment**. The project-generated trips by different ways of travel and directional distribution obtained in the previous steps were then used as the basis for assigning vehicle trips to the local streets in the study area.

Step 1: Trip Generation

Travel demand for the residential and retail uses within the residential development is based on the 2019 SF Guidelines. In addition, because it is anticipated that the 52,000 square feet of administrative, training, and office space of the transit facility would operate similarly to traditional office use, the travel demand for this use was also based on the 2019 SF Guidelines trip generation information.

The travel demand for the bus maintenance and storage and bus operations uses within the transit facility is based on trip generation rates developed from vehicle and pedestrian counts and observations at the existing facility. To estimate travel demand associated with the new transit facility, driveway counts were conducted at the existing facility to obtain daily and hourly volumes of buses, automobiles, bicycles, pedestrians and trucks traveling to and from the site on a typical weekday. Field data collection was conducted on Thursday, May 31, 2018 and Thursday March 12, 2020. The counts conducted in 2018 included buses, trucks and automobiles while the counts conducted in 2020 included buses, trucks, automobiles, bicycles and pedestrians. The vehicular counts from 2020 were 1.1 percent higher (a total increase of 11 vehicles) than those observed in 2018, indicating that the level of site activity was similar across the two counts. Vehicles using the four existing entrances were categorized as autos, trucks or buses.

On a daily basis, there were 952 total vehicles entering and exiting the four existing driveways for the facility (183 inbound and 187 outbound via 17th Street, and 290 inbound and 292 outbound on Mariposa Street). Of the 952 daily vehicles, 32 percent were buses, and 68 percent were autos and trucks. In addition, there were eight bicycle trips and 395 pedestrian trips made to and from the site, for a total of 1,202 daily person trips. This assumes an average occupancy of 1.23 passengers per vehicle, as indicated in the 2002 SF Guidelines[3] for work trips to and from the southeastern portion of the city.[4]

[3] San Francisco Planning Department, Transportation Impact Analysis Guidelines for Environmental Review, October 2002.

[4] The 1,202 person trips were calculated as follows: 650 passenger vehicles * 1.23 average vehicle occupancy = 798 person trips by vehicle. These were then added to the person trips by foot and by bicycle (798 + 396 + 8) for a total of 1,202 person trips.

During the 4 p.m. to 6 p.m. peak period, the greatest number of trips entering and exiting the facility occurred between 4:30 p.m. and 5:30 p.m. (ten autos and trucks, four buses, two bicycles, and 15 pedestrians), which represent one percent of the daily total vehicle count and two percent of daily person trips.

The peak hour for vehicle activity to and from the site occurred from 5:45 a.m. to 6:45 a.m., with 73 auto and truck trips, 42 bus trips, and 45 pedestrian trips, representing twelve percent of total daily vehicle activity and eleven percent of daily person trips.

Table 2 documents the process used to develop trip generation rates for the transit facility's bus maintenance and storage and bus operations uses.

Person trip generation rates for the existing **bus maintenance and storage** use were determined by dividing the person trips calculated above by the total number of on-site employees. Way of travel data was only then applied to the total number of person trips; this allows for the inclusion of employees who may park off-site and then walk to the site from their parking location; this analysis is presented in **Step 2** below, beginning on page 13.

The vehicle trip rates for existing **bus operations** (i.e., activity of revenue service vehicles / trolley coaches traveling to and from the site) were created by dividing the daily and p.m. peak hour bus trips by the total number of parking stalls provided for trolley coaches (i.e., the "crush load" number of buses currently accommodated at the site).

Table 2: Development of Vehicle and Person Trip Generation Rates for the Transit Facility

Period	Land Use	Vehicle Driveway Count[1]	Person Trips per Vehicle	Pedestrian and Bicyclist Driveway Count	Total Trips	Unit	Trip Rate
Daily	Bus Maintenance & Storage	650	1.23	403	1,202 person trips	400 Employees	3.0 trips per employee
	Bus Operations	302	-	-	302 vehicle trips	158 Trolley Coach Parking Spaces	1.9 vehicle trips per bus
PM Peak Hour	Bus Maintenance & Storage	10	1.23	15	27 person trips	400 employees	0.07 person trips per employee
	Bus Operations	4	-	-	4 vehicle trips	158 trolley coach parking spaces	.03 vehicle trips per bus

1. Vehicle counts for bus maintenance and storage include autos and trucks only; vehicle counts for bus operations include buses only.

Source: Fehr & Peers, 2020; 2002 SF Guidelines, Tables C-2, E-5, and E-15.

As shown in **Table 2,** the existing facility generates very few trips during the p.m. peak hour (in this case, from 4:30 p.m. to 5:30 p.m.). This is because buses generally leave the yard to access their route between 4 a.m. and 7 a.m., and return to the yard in the evening between 7 p.m. and 9 p.m., and therefore most employees work non-standard shifts, with the majority of morning employee commute trips occurring before the traditional a.m. peak period, and the majority of evening commute trips occurring after the traditional p.m. peak period. The peak hour of vehicle trip generation for the existing facility is from 5:45 a.m. to 6:45 a.m.

As noted above, the transit facility's administrative and office uses were analyzed using the standard 2019 SF Guidelines trip generation rates. To estimate the number of employees associated with the bus maintenance and storage operations, the employees associated with the administrative and office uses were subtracted from the total 829 projected employees. To estimate the share of employees represented by the office land use, an employee density of 276 sq. ft. per employee from the 2002 SF Guidelines was applied to the 52,000 square feet of administrative and office

space. This resulted in an estimate of approximately 100 office-based employees, and 729 bus operations and maintenance employees for the proposed project. Using these employee estimates and the rates presented in **Table 2**, total person trips were estimated for each project element. **Table 3** presents the number of total and net-new person trips generated by the proposed project on a daily basis and during p.m. peak hour.

In total, the project would result in a total of 11,456 daily person trips; of those, 10,254 would be new person trips. The transit facility would account for 2,739 of those new trips. During the PM peak hour, the project would result in 898 total person trips, of which 870 would be new person trips. The transit facility would account for 118 of those new trips.

Table 3: Proposed Project Daily and P.M. Peak Hour Person Trip Generation

Land Use	Amount	Daily Person Trip Rate[1]	P.M. Peak Hour Trip Rate[1]	Daily Person Trips[2]	P.M. Peak Hour Person Trips[2]
EXISTING FACLITY					
Bus Maintenance and Storage	**400 employees**	**3.01**	**0.07**	**1,202**	**28**
Bus Operations[3]	158 trolley coach parking spaces	**1.91**	**0.03**	**N/A**	**N/A**
Existing Person Trips				**1,202**	**28**
PROPOSED PROJECT					
Transit Facility					
Administrative & Office Space	52 ksf[4]	15.7	1.4	816	73
Bus Maintenance & Storage	640 employees[4]	3.0	0.07	1,923	45
Bus Operations[2]	213 trolley coach parking spaces	N/A	N/A	N/A	N/A
Subtotal SFMTA Transit Facility Person Trips				**2,739**	**118**
Residential Development					
Residential	837 bedrooms[5]	4.5	0.4	3,767	335
Commercial/Retail	33 ksf	150	13.5	4,950	446
Subtotal Residential Development Person Trips				**8,717**	**780**
Total Proposed Project Person Trips				**11,456**	**898**
Net-New Person Trips (Proposed Project less Existing)[6]				**10,254**	**870**

Notes:

1. Daily and p.m. peak hour trip generation for bus maintenance and storage and bus operations are taken from driveway counts and shown in Table 2 above. Daily and p.m. peak hour trip generation rates are based on 2019 SF Guidelines for residential, office and retail uses. Trip rates are expressed per bedroom for residential and per ksf for office and retail.
2. Totals may not sum precisely due to rounding
3. Bus operations refers solely to operation of Muni revenue service vehicles and buses, and as such does not estimate "person" trips for this specific project use.
4. Administrative office and training uses at the proposed transit facility would employ approximately 188 employees. The remainder (640 employees) are assumed to have similar schedules and travel patterns as employees at the existing facility.
5. 575 residential units, consisting of 141 studios, 206 1-bedroom units, 194 2-bedroom units, and 34 3-bedroom units
6. The project will be analyzed based on net-new daily and p.m. peak person and vehicle trips generated by the proposed uses.

Source: 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020.

Step 2: Ways People Travel

The ways of travel for bus operators and other non-administrative staff is based on 2019 travel surveys of employees at the Woods Maintenance Yard in the Dogpatch Neighborhood (for work trips) and the 2002 SF Guidelines for PDR uses (for non-work trips, and for the share of daily and peak hour trips that constitute work trips). **Table 4** shows the weighted average mode split for non-administrative employees at the site based on these methods. As such, the ways people travel as a percentage of all trips are different between the peak hour and off-peak periods for the operations portion of the transit facility. For all other land uses, the 2019 SF Guidelines were used to establish the ways people travel. The estimated ways that people travel to and from the project site for all land uses combined are presented in **Table 5**, and are based on both survey data and the methods contained in the 2019 SF Guidelines for residential, office, and retail uses using place type 2[5].

Table 4: Summary of Mode Split by Land Use

Way of Travel	Work Trips	Non-Work Trips	PM Weighted Average	Daily Weighted Average
Bus Operations and Maintenance				
Percentage of All Trips that are Work Trips			40%	67%
Auto	96%	57%	72%	83%
Transit	2%	19%	12%	7%
Walk	1%	16%	10%	6%
Bike/Taxi/TNC	1%	8%	5%	3%

Notes:

1. Auto trips for the transit facility include trucks and service vehicles. Heavy vehicles other than buses represented 2.9% of total daily volumes to and from the site.

Source: 2002 and 2019 SF Guidelines, SF Planning Department; 2019 Employee Travel Survey, SFMTA; 2002 SF Guidelines, Tables E-5 and E-15; Fehr & Peers, 2020.

[5] The San Francisco Planning Department's travel demand methodology defines neighborhood travel characteristics based on three place types, including place type 1: urban high density, low auto mode share, place type 2: urban medium density, medium auto mode share, and place type 3: urban low density, high auto mode share. The Mission, Potrero Mission, Potrero, Marina, Western Marina and Western Market areas are designated as place type 2.

Table 5: Proposed Project Daily and P.M. Peak Hour Trip Generation by Mode

	Residential Development		Transit Facility	
Way of Travel	**Daily Person Trips**	**P.M. Peak Hour Person Trips**	**Daily Person Trips**	**P.M. Peak Hour Person Trips**
Auto	2,747 (32%)	246 (31%)	1,903 (69%)	60 (51%)
Taxi/TNC	201 (2%)	18 (2%)	156 (6%)	11 (9%)
Transit	1,340 (15%)	120 (15%)	402 (15%)	29 (24%)
Walk	4,143 (48%)	371 (48%)	256 (9%)	17 (14%)
Bike	285 (3%)	26 (3%)	23 (1%)	2 (2%)
Total Person Trips	**8,717**	**780**	**2,739**	**118**
Vehicle Type	**Daily Vehicle Trips**	**P.M. Vehicle Trips**	**Daily Vehicle Trips**	**P.M. Peak Hour Vehicle Trips**
Auto[1]	1,839	155	1,567	49
Taxi/TNC[2]	270	22	372	22
Bus (Muni Operations)	-	-	407	5
Total Vehicle Trips	**2,109**	**177**	**2,346**	**76**

Notes:
1. Auto trips for the transit facility include trucks and service vehicles. Heavy vehicles other than buses represented 2.9% of total daily volumes to and from the site.
2. Taxi/TNC vehicle trips have been doubled to account for separate vehicle trips both to and from the project site.

Source: 2002 and 2019 SF Guidelines, SF Planning Department; 2002 SF Guidelines, Tables E-5 and E-15; Fehr & Peers, 2020.

Table 6 presents the daily and p.m. peak hour vehicle trips generated by the proposed project, disaggregated by private auto/truck, taxi/TNC, and bus operations. The project would generate around 4,455 daily vehicle trips, with 242 of those trips occurring during the p.m. peak hour. Of these, 3,208 daily vehicle trips and 215 p.m. peak hour vehicle trips would be new to the roadway network after accounting for current activity at the site.

Table 6: Proposed Project Daily and P.M. Peak Hour Vehicle Trip Generation[1]

Vehicle Type	Daily			P.M. Peak Hour		
	Total	In	Out	Total	In	Out
Transit Facility						
Auto/Truck	1,567	782	785	49	12	37
Taxi/TNC[2]	372	186	186	21	11 *(2)*	11 *(8)*
Bus	407	204	204	5	2	4
Subtotal Transit Facility	2,346	1172	1,175	76	24	52
Vehicle Trips at Existing Site	1,247	620	627	27	9	18
Net-New Transit Facility Trips	**1,099**	**552**	**547**	**49**	**15**	**34**
Residential Development						
Auto	1,839	933	906	155	104	51
Taxi/TNC[2]	270	135	135	23	11 *(3)*	11 *(8)*
Subtotal Residential Development	2,109	1,068	1,041	177	115	62
Total Project Vehicle Trips	**4,456**	**2,240**	**2,216**	**253**	**139**	**114**
Proposed Project Net-New Vehicle Trips	**3,208**	**1,620**	**1,589**	**226**	**130**	**96**

Notes:
1. Totals may not sum precisely due to rounding.
2. Taxi/TNC vehicle trips have been doubled to account for separate vehicle trips both to and from the project site. For PM peak hour, trips presented in parentheses (*x)* represent the number of trips that are 'deadhead' trips, or trips without a passenger.

Source: 2002 and 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020.

Step 3: Common Destinations

Table 7 shows the estimated distribution of vehicle and transit trips during the p.m. peak hour, for both inbound and outbound trips. Trips are distributed from the project site's neighborhood district to eight San Francisco neighborhoods, as well as the South Bay (including the Peninsula), East Bay, and North Bay. Note that Table 6 shows net-new trips, and therefore includes a small number of bus trips (five) generated from the proposed project's transit facility. Because buses may be traveling to or from many different locations, they are included so that the final vehicle assignment reflects the total number of vehicles added to the roadway.

The share of vehicle and transit trips to/from each destination was calculated using methods from the 2019 SF Guidelines alone, in order to best reflect travel patterns from a more recent travel

survey.[6] For the PM peak hour, trips associated with bus operations and maintenance employees were distributed using the same percentage distributions as office workers. The PDR-like aspects of the project are expected to generate only one net new p.m. peak hour vehicle trip (with the vast majority of trips occurring at other time periods); as such, use of distributions for the office land use are sufficient for these purposes.

Table 7: Proposed Project P.M. Peak Hour Net-New Vehicle and Transit Person Trips by Place of Origin or Destination

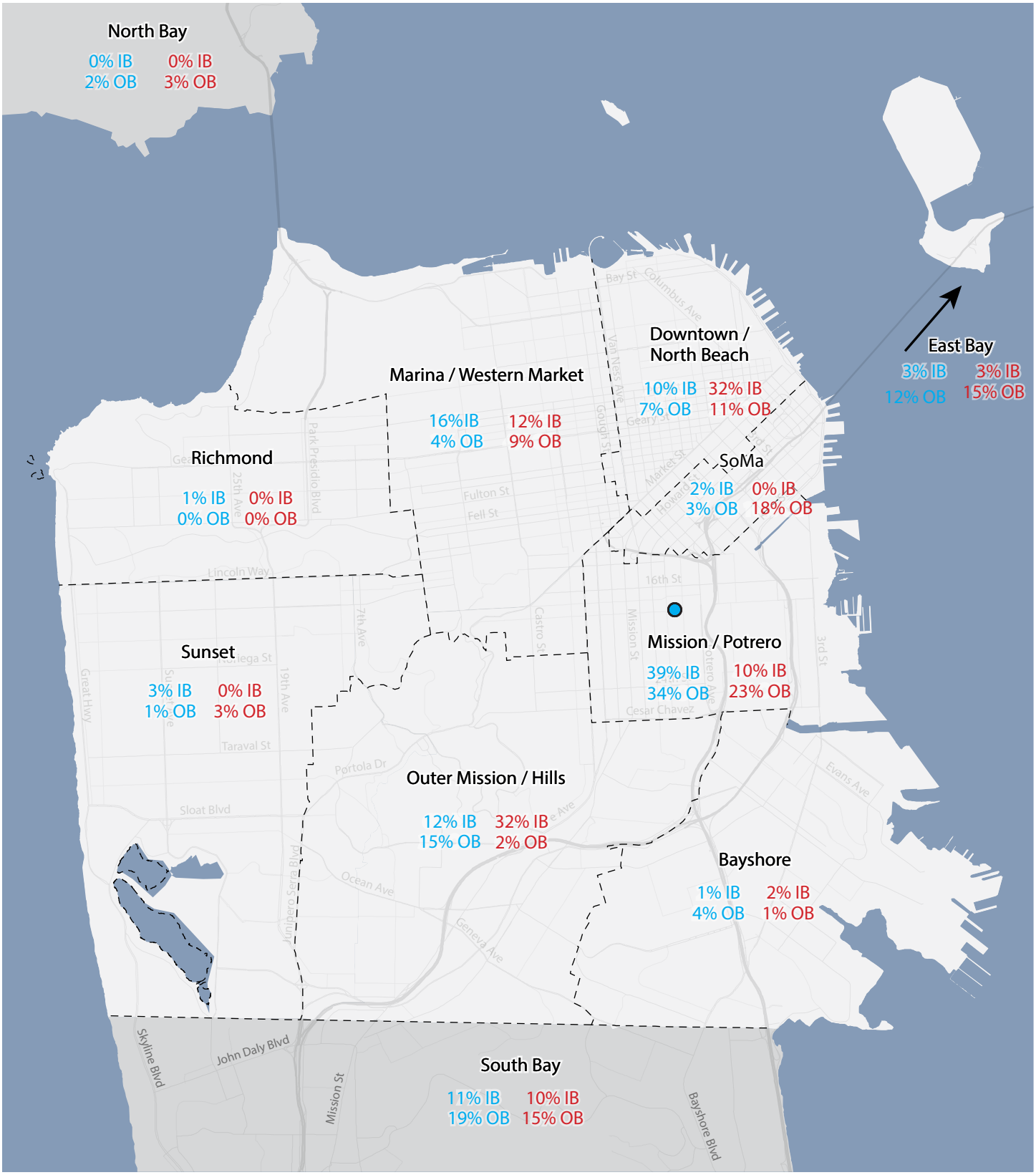
	Vehicle Trips		Transit Person Trips[1]	
Origin/Destination	**In**	**Out**	**In**	**Out**
Downtown/North Beach	13	7	30	5
South of Market	3	2	0	9
Marina/Western Market	21	3	12	5
Mission/Potrero Hill	51	33	9	12
Outer Mission/Hills	16	14	31	1
Bayshore	2	3	2	1
Richmond	2	0	0	0
Sunset	4	1	0	2
Treasure Island	0	0	0	0
South Bay	15	19	10	8
East Bay	4	11	3	8
North Bay	0	2	0	2
Total	**130**	**96**	**96**	**52**

1. "Transit trips" refers to person trips made by transit (i.e., employees using Muni services to commute). Peak hour trips made by buses/revenue-service vehicles are included in "vehicle trips"

Source: 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020

The distribution percentages used to derive the trips in **Table 6** are shown in **Figure 2**.

[6] While the project is located in Place Type 2, and the standard SF Guidelines guidance indicates such projects should include distribution by the place type average rather than district average, this analysis utilizes the district average. This decision was based on a desire to better reflect localized traffic within the Mission/Potrero Hill area.



Proposed Project Site

SF Planning Neighborhood District Boundaries

XX% IB Inbound PM Vehicle Trip Distribution %
XX% OB Outbound PM Vehicle Trip Distribution %
XX% IB Inbound PM Transit Trip Distribution %
XX% OB Outbound PM Transit Trip Distribution %

Miles
0 1 2

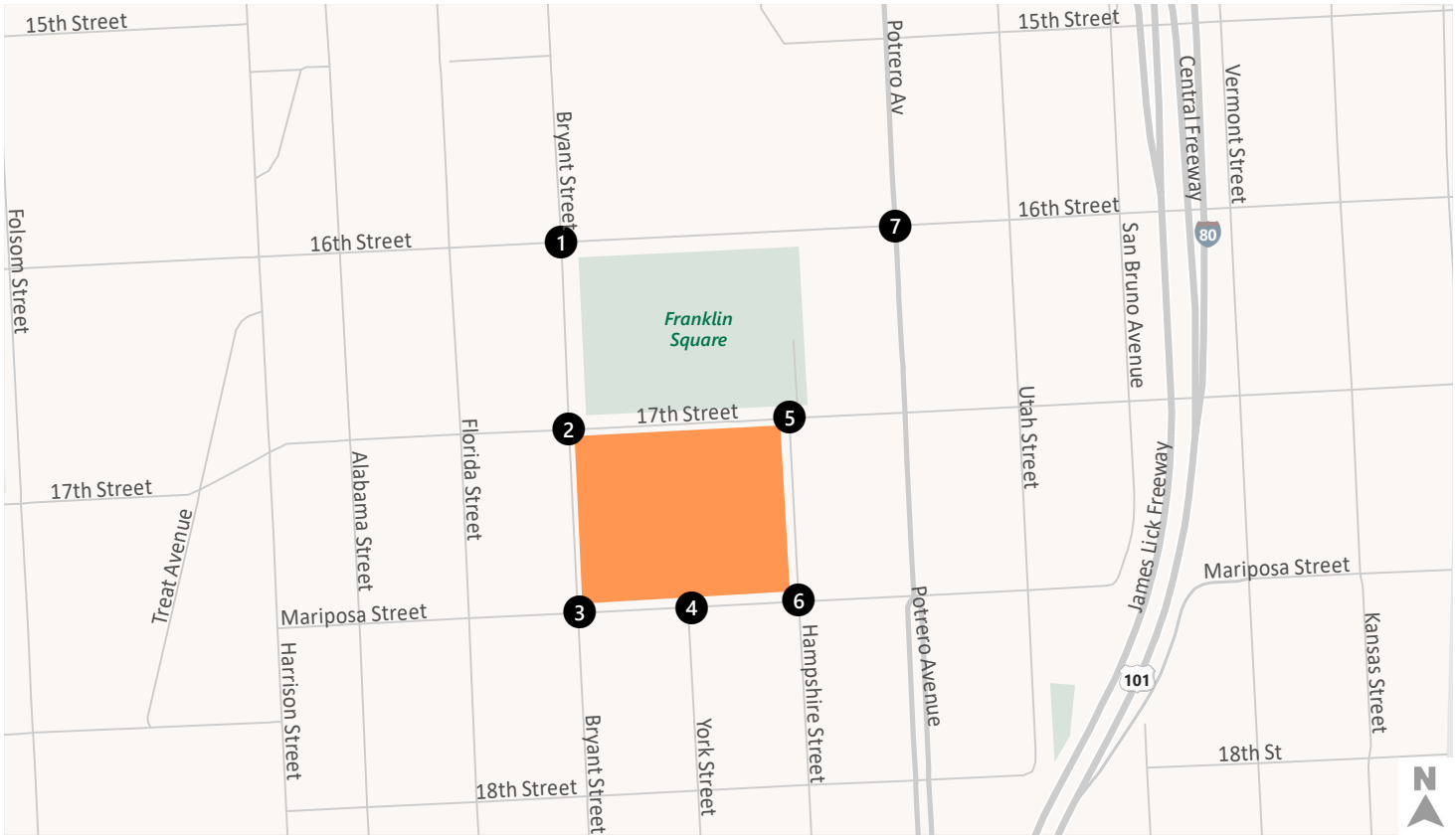
Figure 2

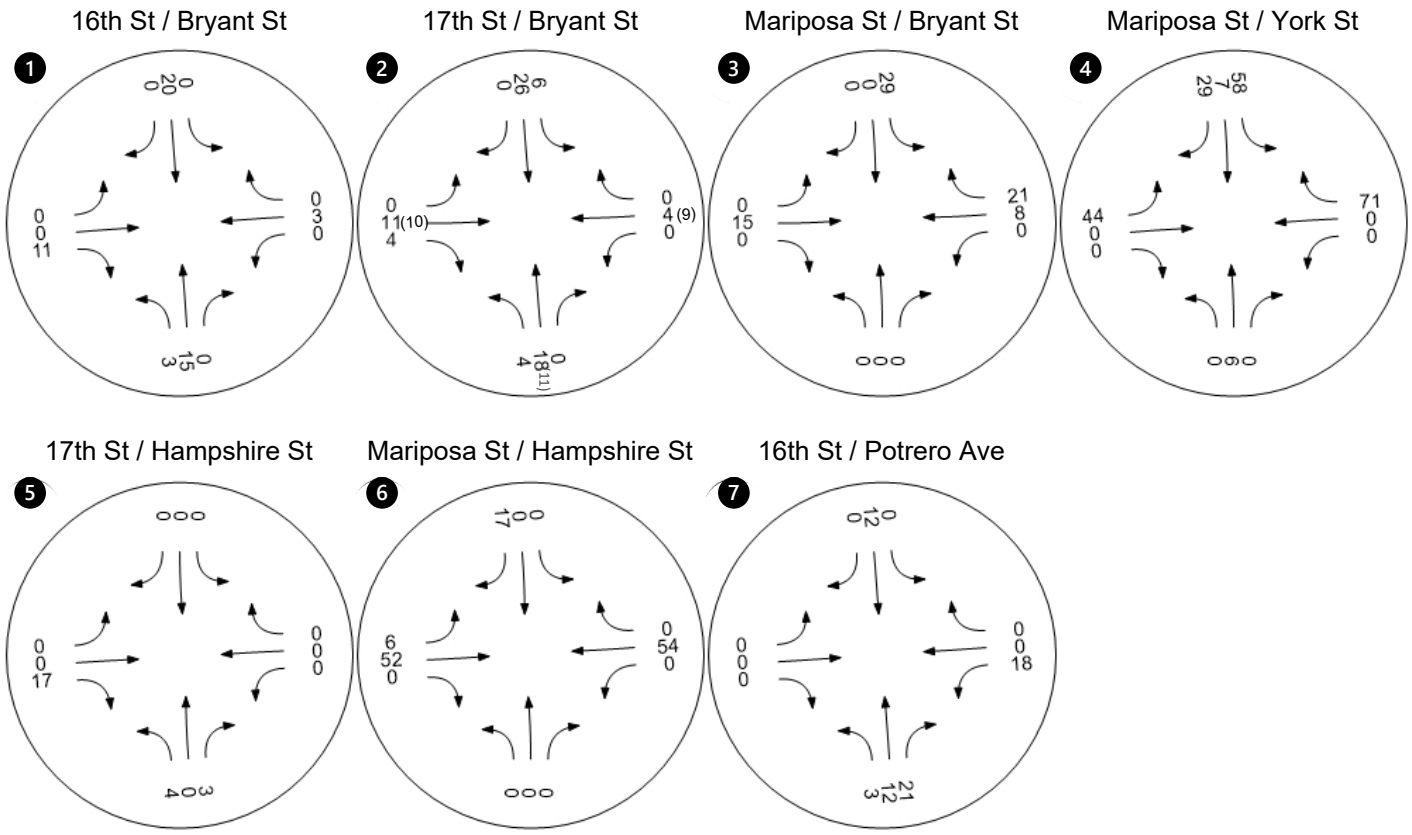
Project Vehicle and Transit Trip Distribution - PM Peak

Step 4: Vehicle Trip Assignment

The project-generated inbound and outbound vehicle trips by the various neighborhood origins and destinations presented in **Table 7** were used as a basis for assigning vehicle trips to the local street network near the project site for p.m. peak hour conditions. Travel paths were developed based on the most direct routes according to the type of vehicle, number of travel lanes on streets, and knowledge of current travel patterns in the study area.

The proposed project would restrict vehicle access for the transit facility to only allow access via a driveway located on Mariposa Street. The residential development would not include any on-site vehicle parking spaces. As such, as a conservative assumption, all net-new vehicle trips were assigned to the Mariposa Street frontage. As discussed above, some vehicle trips may park in the surrounding neighborhood rather than at the project site. While all vehicle trips were assigned based on a final destination at the project site, there may be some additional vehicle activity outside of study intersections due to searching for parking. Assignment of p.m. peak hour vehicle trips to the roadway network is shown in **Figure 3.**





Note: Volumes are presented as **# Project Trips (# TNC Deadhead Trips)**. 8 (10) indicates the intersection would gain an additional 8 trips serving travel to/from the proposed project, plus 10 trips associated with the deadhead portion of a TNC trip.

Figure 3

Traffic Volume - Net New Site Trips

Proposed Project Passenger and Freight Loading Demand

Passenger loading demand was calculated using the passenger loading methodology for taxi/TNC and pick-up/drop-off vehicle trip demand in Appendix F of the 2019 SF Guidelines. For the transit facility, passenger loading demand was calculated for the two uses of the facility (i.e., administrative and office, and bus maintenance and storage) that would be expected to generate passenger loading demand during the p.m. peak hour. Project passenger loading demand is summarized in **Table 8.** During the p.m. peak hour, the proposed project would have a demand for two spaces of passenger loading during any one minute of the peak 15 minutes of loading activities, accounting for potential simultaneous peak hours for all project land uses.

Table 8: Proposed Project P.M. Peak Hour Passenger Loading Space Demand

Land Use	P.M. Peak Hour Person Trips	Passenger Loading Demand Rate	Peak Hour Loading Demand (Total Instances)
Transit Facility			
Administrative & Office	73	13.4%	10
Bus Maintenance & Storage	45	13.4%	6
		Total Transit Facility	**16**
Residential Development			
Residential	335	7.2%	24
Retail	54	3.0%	2
		Total Residential Development	**26**
Total Proposed Project Peak Hour Loading Instances			**40**
Peak Hour Average Loading Space Demand			**1 space**
Peak 15 Minute Loading Space Demand			**2 spaces**

Source: 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020

Freight loading demand calculated using Table 3 from the Appendix F in the 2019 SF Guidelines. This methodology is used to estimate the number of truck loading spaces required to accommodate the freight delivery and service vehicle demand during the peak hour throughout the average weekday peak period. For the transit facility, freight loading demand was calculated for the administrative and office uses, a new land use currently not accommodated within the existing facility. A specific estimate of the number of truck loading spaces for the demand of the bus

maintenance and storage and bus operations uses was not determined, as these loading activities would be accommodated off-street within the facility's square footage allocated to these uses (i.e., these types of deliveries would likely not be conducted in on-site loading spaces shared with the administrative and office deliveries).

Table 9 presents the project's freight and commercial loading demand calculations for the proposed project. The administrative/office, residential and retail uses would generate in total about 14 trucks per day, which corresponds to a demand for two loading spaces during the peak hour of the midday peak period (generally from 10 a.m. to 11 a.m.).

Table 9: Proposed Project Freight Loading Space Demand

Land Use	Amount (1,000 square feet)	Daily Freight Trip Rate (per 1,000 square feet)	Trucks per Day	Peak Hour Loading Space Demand
Transit Facility				
Administrative & Office	52	0.21	11	1
Total Freight Loading Demand, Transit Facility			**11**	**1**
Residential Development				
Residential	54.4	0.03	2	1
Retail	4	0.22	1	1
Total Freight Loading Demand, Residential Development			**3**	**1**[1]
Project Total Freight Loading Demand			**14**	**2**

1. Total does not sum due to rounding.

Source: 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020

Screening for Quantitative Transit Service Delay Analysis

As presented in **Table 6** above, the proposed project would generate 225 net-new vehicle trips during the p.m. peak hour (47 for the transit facility and 177 for the residential development), which would be less than the screening criteria of 300 project vehicle trips during the p.m. peak hour used by the department to determine if transit routes traveling through the project study area are likely to be significantly delayed by the proposed project. Transit service delay analysis specifically addresses delay due to vehicle delay affecting service vehicles and increased transit use, rather than the effects on non-revenue services or changes to non-revenue facilities. Therefore, because the

proposed project would not exceed the screening criteria for added new vehicle or transit trips, a quantitative transit delay analysis is not required as part of the public transit impact analysis.

Employee and Family Support Variant

The Employee and Family Support Variant would replace 9,000 square feet of commercial space with a childcare facility. This facility is expected to accommodate 25 employees, and provide care for up to 100 children. Because the facility is expected to partially serve as an on-site accessory use and amenity for both the residential development and the transit facility, 30 percent of students are assumed to have trips internal to the site; i.e., to have a guardian who either lives or works at the project location, resulting in 70 students traveling to or from the site from external locations each day. **Table 10** summarizes the total person trips associated with this variant.

Table 10: Employee and Family Support Variant Daily and P.M. Peak Hour Person Trip Generation

Land Use	Amount	Daily Person Trip Rate[1]	P.M. Peak Hour Trip Rate[1]	Daily Person Trips[2]	P.M. Peak Hour Person Trips[2]
EXISTING FACLITY					
Bus Maintenance and Storage	**400 employees**	**3.01**	**0.07**	**1,202**	**28**
Bus Operations[3]	158 trolley coach parking spaces	**1.91**	**0.03**	**N/A**	**N/A**
Existing Person Trips				**1,202**	**28**
PROPOSED PROJECT					
Transit Facility					
Administrative & Office Space	52 ksf[4]	15.7	1.4	816	73
Bus Maintenance & Storage	640 employees[4]	3.0	0.07	1,923	45
Bus Operations[2]	213 trolley coach parking spaces	N/A	N/A	N/A	N/A
Subtotal SFMTA Transit Facility Person Trips				**2,739**	**118**
Residential Development					
Residential[1]	837 bedrooms[3]	4.5	0.4	3,767	335
Commercial/Retail[1]	24 ksf	150	13.5	3,600	324
Childcare	9 ksf	20.9[6]	8.0[6]	188	72
Subtotal Residential Development Person Trips				7,555	731
Total Proposed Project Person Trips				**10,294**	**849**
Net-New Person Trips (Proposed Project less Existing)				**9,092**	**821**

Notes:

1. Daily and p.m. peak hour trip generation for bus maintenance and storage and bus operations are taken from driveway counts and shown in Table 2 above. Daily and p.m. peak hour trip generation rates are based on 2019 SF Guidelines for residential, office and retail uses. Trip rates are expressed per bedroom for residential and per ksf for office and retail.
2. Totals may not sum precisely due to rounding
3. Bus operations refers solely to operation of Muni revenue service vehicles and buses, and as such does not estimate "person" trips for this specific project use.
4. Administrative office and training uses at the proposed transit facility would employ approximately 188 employees. The remainder are assumed to have similar schedules and travel patterns as employees at the existing facility.
5. 575 residential units, consisting of 141 studios, 206 1-bedroom units, 194 2-bedroom units, and 34 3-bedroom units
6. Rates are weighted based on 25 employees and 100 students, with 88 percent of employees arriving and departing during the PM peak hour of the generator, and 72 percent of students departing during the PM peak hour of the generator. In addition, 30 percent of students are assumed to either live on the site, or have guardians who work on-site.

Source: 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020.

Based on travel surveys conducted at the Schools of the Sacred Heart in Pacific Heights, which serves a K-12 population, and office land use guidance for employees from the 2019 SF Guidelines, **Table 11** shows the ways people are expected to travel to and from the childcare land use. The expected ways of travel for other land uses are the same as those discussed earlier in this memorandum, and shown in **Table 4.**

Table 11: Summary of Ways People Travel, Childcare Land Use

Way of Travel	Employees	Students	PM Weighted Average	Daily Weighted Average
Childcare – Mode Share				
Auto	44%	77.8%	67%	69%
Taxi/TNC	13%	0%	4%	3%
Transit	21%	8.%	13%	11%
Walk	19%	14%	15%	15%
Bike	4%	0.2%	1%	1%
Childcare – Person Trips by Mode				
			PM Peak Hour	**Daily**
Auto			48	130
Taxi/TNC			3	6
Transit			9	21
Walk			11	29
Bike			1	2

Source: 2002 and 2019 SF Guidelines, SF Planning Department; 2019 Employee Travel Survey, SFMTA; 2002 SF Guidelines, Tables E-5 and E-15; Fehr & Peers, 2020.

The information in Table 11 was translated into vehicle trips by assuming that taxi and TNC trips result in two vehicle trips (one inbound, one outbound), and that private vehicle trips to drop-off children also result in two vehicle trips (one inbound, one outbound). In addition, due to the prevalence of siblings arriving at the site together, an average occupancy of 1.3 students per vehicle was used in calculating the number of auto trips associated with each student. These totals are compiled, and summarized along with the remainder of the project, in **Table 12** and **Table 13**. As shown therein, the Employee and Family Support Variant results in slightly higher levels of vehicle trip making, with an estimated 278 P.M. peak hour vehicle trips, compared to 226 peak hour vehicle trips for the proposed project. However, much of this activity is due to pick-up and drop-off activity,

which typically represents a diverted trip, with drivers going from work to pick-up to home, rather than adding an entirely new trip.

Table 12: Summary of Person Trips and Vehicle Trips for Employee and Family Support Variant

	Residential Development		Transit Facility	
Way of Travel	**Daily Person Trips**	**P.M. Peak Hour Person Trips**	**Daily Person Trips**	**P.M. Peak Hour Person Trips**
Auto	2,528	262	1,903	60
Taxi/TNC	188	19	156	11
Transit	1,177	115	402	29
Walk	3,395	312	256	17
Bike	250	23	23	2
Total Person Trips	**7,537**	**732**	**2,739**	**118**
Vehicle Type	**Daily Vehicle Trips**	**P.M. Vehicle Trips**	**Daily Vehicle Trips**	**P.M .Peak Hour Vehicle Trips**
Auto[3]	1,795	203	1,567	49
Taxi/TNC[2]	258	26	372	21
Bus	-	-	407	5
Total Vehicle Trips	**2,053**	**229**	**2,346**	**76**

Source: 2002 and 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020.

Table 13: Employee and Family Support Variant Daily and P.M. Peak Hour Vehicle Trip Generation[1]

Vehicle Type	Daily			P.M. Peak Hour		
	Total	In	Out	Total	In	Out
Transit Facility						
Auto/Truck	1,567	782	785	49	12	37
Taxi/TNC[2]	372	186	186	21	11 *(2)*	11 *(8)*
Bus	407	204	204	5	2	4
Subtotal Transit Facility	2,346	1172	1,175	76	24	52
Vehicle Trips at Existing Site	1,247	620	627	27	9	18
Net-New Transit Facility Trips	**1,099**	**552**	**547**	**49**	**15**	**34**
Residential Development						
Auto	1,795	914	882	203	124	78
Taxi/TNC[2]	258	129	129	26	13 *(13)*	13 *(0)*
Subtotal Residential Development	**2,053**	**1,043**	**1,010**	**229**	**138**	**92**
Proposed Project Net-New Vehicle Trips	**3,152**	**1,595**	**1,558**	**278**	**152**	**125**

Notes:
1. Totals may not sum precisely due to rounding.
2. Taxi/TNC vehicle trips have been doubled to account for separate vehicle trips both to and from the project site. For PM peak hour, trips presented in parentheses (*x)* represent the number of trips that are 'deadhead' trips, or trips without a passenger.

Source: 2002 and 2019 SF Guidelines, SF Planning Department; Fehr & Peers, 2020.

Because of the increase in pick-up and drop-off activity, the variant also generates an increase in total passenger loading demand relative to the proposed project. Loading demand for this variant is presented in **Table 14**. Freight loading demand for this variant would remain the same as for the proposed project (a demand for three loading spaces during the peak hour of loading activities); however, the passenger loading space demand would increase due to the introduction of the childcare uses. The passenger loading duration for a childcare use is typically longer than for other uses, with observations at sites serving kindergartens showing a duration of between two and five minutes. The Employee and Family Support Variant would generate about 81 loading instances during the p.m. peak hour, which corresponds to a demand for eight spaces of passenger loading during any one minute of the peak 15 minutes of loading activities (compared to 52 loading instances and a demand for two spaces for passenger loading for the proposed project). During the p.m. peak hour the childcare use would generate a demand for six of the eight spaces of passenger loading.

Table 14: Employee and Family Support Variant Freight and Passenger Loading Demand by Land Use

Land Use	Freight Loading [1]		Passenger Loading [2]	
	Daily Delivery and Service Vehicles	Peak Hour Loading Space Demand	P.M. Peak Hour Loading Instances	P.M. Peak Hour Peak Minute Loading Space Demand
Transit Facility				
Administrative & Office	11	1	10	1
Bus Maintenance & Storage	n/a	n/a	4	
Joint Development				
Residential	16	1	24	1
Retail	6	1	10	
Childcare[3]			33[4]	6
Total[5]	**34**	**3**	**81**	**8**

Notes:
1. Freight loading demand is presented as the number of delivery and service vehicle trips per time period. The peak period of freight loading demand typically occurs between 10 a.m. and 1 p.m. and does not coincide with the weekday a.m. or p.m. peak periods.
2. Passenger loading is presented as the passenger loading trips estimated to occur during the p.m. peak period. The peak period of passenger loading demand generally occurs during the extended weekday p.m. peak period of 3 p.m. to 7 p.m; it occurs during the typical mid-afternoon pick-up period for the childcare facility. The passenger loading space demand is presented for the peak one minute of the peak 15-minutes of the p.m. peak hour.
3. Loading duration for childcare is assumed to be five minutes, compared to one minute for all other uses
4. 33 passenger loading instances consist of 39 students (1.3 students per vehicle) and 3 employees.
5. The delivery and service vehicle trips, passenger loading instances, and the freight and passenger loading space demand for each land use were rounded up to whole numbers, and therefore the totals may not sum due to rounding.

Summarize existing trips by vehicle type and driveway

		Autos & Trucks								Buses				Vehicle Totals, All Driveways										
		Mariposa (D2, D3, D4)		17th Street (D1)		Mariposa (D2, D3, D4)		17th Street (D1)		LDA/LDT/MDT		BUS		ALL			Bikes		Peds		Total Person Trips		
	Hour	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	In	Out	**In**	**Out**	**Total**
AM Peak Hour	8:00 AM to 9:00 AM	15	14	4	4	1	3	0	0	19	18	1	3	20	21	41	2	0	10	11	**35**	**33**	**68**
PM Peak Hour	4:30 PM to 5:30 PM	1	1	2	6	2	2	0	0	3	7	2	2	5	9	14	0	0	7	8	**11**	**17**	**28**
Peak Hour of Generator	5:45 to 6:45	40	24	5	4	10	32	0	0	45	28	10	32	55	60	115	0	0	26	19	**81**	**53**	**134**
Daily	Daily	143	148	179	180	147	144	4	7	322	328	151	151	473	479	952	4	4	192	203	**592**	**610**	**1202**

Derive Person Trip Rates

Land Use	Amount	Unit	AM Peak	PM Peak	Daily	Peak Hour of Generator
Maintenance and Operations	400	Total Employees	0.17	0.07	3.005	0.335
		% Inbound	51%	30%	50%	62%
Office/Admin	0	ksf	1.4	1.4	15.7	1.4
Bus Storage Yard	158	Trolley bus parking spaces	0.03	0.03	1.9	0.27
		% Inbound	25%	50%	50%	24%

Office/Admin taken from 2019 SF Guidelines

sq ft per employee	275

Derive weighted mode splits for Maintenance/Operations by time period using survey results and percentage of trips that are work trips

Uses 2002 SF Guidelines for PDR uses in SD-3 (southeast quadrant of City) and SFMTA survey data to calculate mode split for all trip types

				Weighted by Time Period				Source:
Land Use	**Mode Split**	**By Trip Purpose**		**AM**	**PM**	**Daily**	**Pk Hr Gen**	
		Work Trips	**Non-Work Trips**	**67%**	**40%**	**67%**	**67%**	**% of Trips that are Work Trips**
Maintenance & Operations	Auto	96%	57%	83%	72%	83%	83%	
	Transit	2%	19%	7%	12%	7%	7%	
	Walk	1%	16%	6%	10%	6%	6%	
	Other	1%	8%	3%	5%	3%	3%	
	Average vehicle occupancy	1.23	1.23	1.23	1.23	1.23	1.23	Conservatively assumes average work trip AVO for all trips
		Woods Survey, SFMTA	Table E-15, All Visitors					

Calculate existing person trips by mode

Project Land Use	Amount	Unit	AM Peak	AM In	AM Out	PM Peak	PM In	PM Out	Daily	Daily In	Daily Out
Office & Administration	0	ksf									
Maintenance and Operations	400	Employees	68	35	33	28	8	20	1,202	595	607
Bus Storage Yard	158	Trolley bus parking spaces	4	2	2	4	1	3	302	151	151

	Auto Person Trips	56	29	27	20	6	14	998	495	504
	Transit	5	3	2	3	1	2	90	45	45
	Walk	4	2	2	3	1	2	73	36	37
	Taxi & TNC	2	1	1	2	0	1	41	20	21
	Bike									
	Bus (Revenue Service)	4	1	3	4	2	2	302	151	151
	Vehicle Trips (Auto)	46	24	22	17	5	12	812	402	410
	Vehicle Trips (Taxi/TNC)	4	2	2	3	1	2	67	33	34
	Vehicle Trips (Taxi/TNC Deadhead)	4	2	2	3	2	1	67	34	33
	Bus Trips	4	2	2	4	1	3	302	151	151
Transit Facility Total	**Total Existing Vehicle Trips**	58	29	28	27	9	18	1247	620	627

Calculate Project Person Trips by Mode

Project Person Trips

Project Land Use	Amount	Unit	**AM Peak**	AM In	AM Out	**PM Peak**	PM In	PM Out	**Daily**	Daily In	Daily Out
Office & Administration	52	ksf				**73**	10	63	**816**	372	444
Maintenance and Operations	640	Employees	**109**	56	53	**45**	14	32	**1,923**	953	953
Bus Storage Yard	213	Trolley bus parking spaces	**5**	3	2	**5**	2	4	**407**	204	204

	Auto Person Trips	**91**	46	44	**33**	10	23	**1,597**	791	806
	Transit	**8**	4	4	**5**	2	4	**144**	71	73
	Walk	**7**	3	3	**5**	1	3	**116**	58	59
	Taxi/TNC	**4**	2	2	**2**	1	2	**66**	32	33
	Bike									
	Bus (Revenue Service)	**5**	1	4	**5**	3	3	**407**	204	204
	Vehicle Trips (Auto)	**74**	38	36	**27**	8	19	**1299**	643	655
	Vehicle Trips (Taxi/TNC)	**6**	2	4	**4**	1	3	**107**	53	54
	Vehicle Trips (Taxi/TNC Deadhead)	6	4	2	4	3	1	107	54	53
Maintenance and Operations	**Vehicle Trips (Bus / Revenue Service)**	**5**	3	2	**5**	2	4	**407**	204	204

	Auto Person Trips				27	5	22	305	158	147
	Transit				22	3	19	258	82	175
	Walk				12	2	11	140	73	66
	Taxi & TNC				8	1	7	91	47	44
	Bike				2	0	2	23	12	11
	Bus (Revenue Service)									
	Vehicle Trips (Auto)				23	4	19	268	139	130
	Vehicle Trips (Taxi/TNC)				7	1	6	80	41	38
	Vehicle Trips (Taxi/TNC Deadhead)				7	6	1	80	38	41
Office & Admin	**Vehicle Trips (Bus / Revenue Service)**									

	Auto Person Trips	91	46	44	60	15	45	1,903	949	954
	Transit	8	4	4	28	5	23	402	154	248
	Walk	7	3	3	17	3	14	256	131	125
	Taxi & TNC	4	2	2	11	2	8	156	79	77
	Bike	0	0	0	2	0	2	23	12	11
	Bus (Revenue Service)	5	1	4	5	3	3	407	204	204
	Vehicle Trips (Auto)	74	38	36	49	12	37	1,567	782	785
	Vehicle Trips (Taxi/TNC)	6	2	4	11	2	8	186	94	92
	Vehicle Trips (Taxi/TNC Deadhead)	6	4	2	11	8	2	186	92	94
Transit Facility Totals	**Vehicle Trips (Bus / Revenue Service)**	5	3	2	5	2	4	407	204	204

	Amount	Unit	**AM Peak**	AM In	AM Out	**PM Peak**	PM In	PM Out	**Daily**	Daily In	Daily Out
Residential	**837**	**ksf**				**335**	**272**	**62**	**3767**	1870	1881
		Auto Person Trips				130	113	17	1465	767	698
		Transit				64	44	20	732	317	399
		Walk				115	94	21	1292	644	648
		Taxi & TNC				12	10	2	132	69	63
		Bike				13	11	2	147	73	74
		Vehicle Trips (Auto)				81	71	10	998	522	475
		Vehicle Trips (Taxi/TNC)				7	6	1	90	47	43
		Vehicle Trips (Taxi/TNC Deadhead)				7	1	6	90	43	47
	Residential	**Vehicle Trips (Bus / Revenue Service)**									
		Auto Person Trips				115	52	63	1282	626	656
		Transit				53	40	12	584	218	271
		Walk				257	140	116	2851	1360	1491
		Taxi & TNC				6	3	3	69	35	34
		Bike				12	7	6	139	66	72
		Bus (Revenue Service)									
		Vehicle Trips (Auto)				74	33	40	841	411	431
		Vehicle Trips (Taxi/TNC)				4	2	2	45	23	22
		Vehicle Trips (Taxi/TNC Deadhead)				4	2	2	45	22	23
Retail	Retail	**Vehicle Trips (Bus / Revenue Service)**									

Total

	Auto Person Trips				246	166	80	2747	1393	1354
	Transit				116	84	32	1316	535	669
	Walk				371	234	137	4143	2004	2139
	Taxi & TNC				18	13	5	201	104	97
	Bike				26	17	8	285	139	146
	Bus (Revenue Service)									
	Vehicle Trips (Auto)				155	104	51	1839	933	906
	Vehicle Trips (Taxi/TNC)				11	8	3	135	70	65
	Vehicle Trips (Taxi/TNC Deadhead)				11	3	8	135	65	70
	Vehicle Trips (Bus / Revenue Service)				0	0	0	0	0	0
Residential + Retail	**Total Residential Vehicle Trips**				177	115	62	2109	1068	1041

Amount		AM Peak	AM In	AM Out	PM Peak	PM In	PM Out	Daily	Daily In	Daily Out
	Auto Person Trips				305	180	125	4,650	2342	2308
	Transit				144	89	55	1,717	689	917
	Walk				388	237	152	4,399	2135	2264
	Taxi & TNC				28	15	13	357	184	174
	Bike				28	18	10	308	151	157
	Bus (Revenue Service)				5	3	3	407	204	204
	Vehicle Trips (Auto)				204	116	88	3,406	1715	1691
	Vehicle Trips (Taxi/TNC)				22	11	11	321	164	157
	Vehicle Trips (Taxi/TNC Deadhead)				22	11	11	321	157	164
Total Project Trips	**Vehicle Trips (Bus / Revenue Service)**				5	2	4	407	204	204
	Total Vehicle Trips				**253**	**139**	**114**	**4,456**	**2,240**	**2,216**

Net new project Trips

		AM Peak	AM In	AM Out	PM Peak	PM In	PM Out	Daily	Daily In	Daily Out
	Auto Person Trips				40	9	31	904	455	450
	Transit				24	4	21	312	109	203
	Walk				14	2	12	183	95	88
	Taxi & TNC				9	2	7	115	59	56
	Bike				2	0	2	23	12	11
	Bus (Revenue Service)				1	1	1	105	53	53
	Vehicle Trips (Auto)				32	7	25	755	380	375
	Vehicle Trips (Taxi/TNC)				8	1	6	120	61	59
	Vehicle Trips (Taxi/TNC Deadhead)				8	6	1	120	59	61
Transit Facility Totals	**Vehicle Trips (Bus / Revenue Service)**				1	0	1	105	53	53

		AM Peak	AM In	AM Out	PM Peak	PM In	PM Out	Daily	Daily In	Daily Out
	Auto Person Trips				246	166	80	2747	1393	1354
	Transit				116	84	32	1316	535	669
	Walk				371	234	137	4143	2004	2139
	Taxi & TNC				18	13	5	201	104	97
	Bike				26	17	8	285	139	146
	Bus (Revenue Service)									
	Vehicle Trips (Auto)				155	104	51	1839	933	906
	Vehicle Trips (Taxi/TNC)				11	8	3	135	70	65
	Vehicle Trips (Taxi/TNC Deadhead)				11	3	8	135	65	70
Residential + Retail	**Vehicle Trips (Bus / Revenue Service)**								0	0

	Auto Person Trips				285	174	111	3,651	1,847	1,804
	Transit				140	88	53	1,628	645	872
	Walk				386	236	150	4,326	2,099	2,227
	Taxi & TNC				27	15	12	316	163	153
	Bike				28	18	10	308	151	157
	Bus (Revenue Service)				1	1	1	105	53	53
									0	0
	Vehicle Trips (Auto)				187	111	76	2,594	1,313	1,281
	Vehicle Trips (Taxi/TNC)				19	10	9	255	131	124
	Vehicle Trips (Taxi/TNC Deadhead)				19	9	10	255	124	131
Total Project Trips	**Vehicle Trips (Bus / Revenue Service)**				1	0	1	105	53	53
	Total Vehicle Trips				**226**	**130**	**96**	**3,208**	**1,620**	**1,589**

Potrero Yard Modernization Project EIR
Loading Demand Calculations

Passenger Loading

	PM Peak Hour Person Trips	Loading Rate	Peak Hour Loading Demand	Peak Hour Average Spaces of Demand	Peak 15 Minute Loading Demand
Residential	335	7.2%	24.1	0.4	0.8
Retail	446	3.0%	13.4	0.2	0.4
Office	73	13.4%	9.8	0.2	0.3
Bus Yard	29	13.4%	3.9	0.1	0.1
Total Peak Hour Loading Instances			**52.0**		
Peak Hour Average Loading Demand (Loading Spaces)			1		
Peak 15 Minute Loading Demand (Spaces)			2		

Commercial/Freight Loading

	Square Feet (1,000s)	Daily Trip Rate	Daily Trucks/ Service Vehicles	Peak Loading Space Demand
Residential	544	0.03	16.3	0.94
Retail	33	0.22	7.3	0.42
Transit Facility				
Office	52	0.21	10.9	0.63
Bus Yard	576	0.65	374.4	21.67
Total including Bus Yard			408.90	23.66
Total Without Bus Yard			**34.50**	**2.00**

Appendix E-5

Travel Demand for Project Alternatives

FEHR PEERS

Appendix: Travel Demand for Project Alternatives

Project Alternative B

Table B-1: Person Trip Generation by Land Use

Land Use	Amount	Daily Person Trip Rate	P.M. Peak Hour Trip Rate	Daily Person Trips	P.M. Peak Hour Person Trips
EXISTING FACILITY					
Bus Maintenance and Storage	400 employees	3.01	0.07	1,202	28
Bus Operations	158 trolley coach parking spaces	1.91	0.03		
			Existing Person Trips	**1,202**	**28**
PROJECT ALTERNATIVE B					
Transit Facility					
Administrative & Office Space	46.2 KSF	15.7	1.4	725	65
Bus Maintenance & Storage	640 employees	3.0	0.07	1,923	45
Bus Operations	213 trolley coach parking spaces	1.9	0.03		
			Subtotal SFMTA Transit Facility Person Trips	2,648	110
Residential Development					
Residential	694 bedrooms	4.5	0.4	3,123	278
Commercial/Retail		150	13.5	4,950	446
			Subtotal Residential Development Person Trips	8,073	723
			Total Proposed Project Person Trips	**10,721**	**833**
			Net-New Person Trips (Proposed Project less Existing))	**9,519**	**805**

Table B-2: Person Trips by Mode

	Residential Development		Transit Facility	
Auto	2,497	223	1,868	57
Taxi/TNC	179	16	146	10
Transit	1,215	109	373	26
Walk	3,922	352	240	16
Bike	260	23	20	2

Vehicle Type	Daily Vehicle Trips	P.M. Vehicle Trips	Daily Vehicle Trips	P.M .Peak Hour Vehicle Trips
Auto	1,668	141	1,537	47
Taxi/TNC	120	20	177	20
Bus	-	-	407	5
Total Vehicle Trips	**1,788**	**161**	**2,121**	**72**

Table B-3: Vehicle Trips by Type

Vehicle Type	Daily			P.M. Peak Hour		
	Total	In	Out	Total	In	Out
Transit Facility						
Auto	1,537	767	770	47	12	35
Taxi/TNC	355	177	177	20	10	10
Bus	407	204	204	5	2	4
Subtotal Transit Facility	2,299	1147	1,151	72	23	49
Existing Vehicles at Project Site	1247	620	627	27	9	18
Net-New Transit Facility Trips	1,051	527	524	45	14	31
Residential Development						
Auto	1,668	844	825	141	92	49
Taxi/TNC	240	120	120	20	10	10
Subtotal Residential Development	1,908	963	945	161	102	59
Total Project Vehicle Trips	4,207	2,111	2,096	233	125	108
Proposed Project Net-New Vehicle Trips	**2,959**	**1,491**	**1,469**	**206**	**116**	**90**

Project Alternative C

Table C-1: Person Trips by Land Use

Land Use	Amount	Daily Person Trip Rate[1]	P.M. Peak Hour Trip Rate	Daily Person Trips	P.M. Peak Hour Person Trips
EXISTING FACILITY					
Bus Maintenance and Storage	400 employees	3.01	0.07	1,202	28
Bus Operations	158 trolley coach parking spaces	1.91	0.03	n/a	n/a
			Existing Person Trips	**1,202**	**28**
PROJECT ALTERNATIVE C					
Transit Facility					
Administrative & Office Space	46.2 KSF	15.7	1.4	725	65
Bus Maintenance & Storage	640 employees	3.0	0.07	1,923	45
Bus Operations	213 trolley coach parking spaces	1.9	0.03		
			Subtotal SFMTA Transit Facility Person Trips	2,648	110
Residential Development					
Residential	668 bedrooms	4.5	0.4	3,006	267
Commercial/Retail		150	13.5	4,950	446
			Subtotal Residential Development Person Trips	7,956	713
			Total Proposed Project Person Trips	**10,604**	**822**
			Net-New Person Trips (Proposed Project less Existing))	**9,402**	**794**

Table C-2: Person Trips by Way of Travel

	Residential Development		Transit Facility	
Auto	2,451	219	1,868	57
Taxi/TNC	175	16	146	10
Transit	1,192	107	373	26
Walk	3,882	348	240	16
Bike	256	23	20	2

Vehicle Type	Daily Vehicle Trips	P.M. Vehicle Trips	Daily Vehicle Trips	P.M .Peak Hour Vehicle Trips
Auto	1,637	138	1,537	47
Taxi/TNC	117	20	177	20
Bus	-	-	407	5
Total Vehicle Trips	**1,754**	**158**	**2,121**	**72**

Table C-3: Vehicle Trips

Vehicle Type	Daily			P.M. Peak Hour		
	Total	In	Out	Total	In	Out
Transit Facility						
Auto	1,537	767	770	47	12	35
Taxi/TNC	355	177	177	20	10	10
Bus	407	204	204	5	2	4
Subtotal Transit Facility	2,299	1147	1,151	72	23	49
Existing Vehicles at Project Site	1247	620	627	27	9	18
Net-New Transit Facility Trips	1,051	527	524	45	14	31
Residential Development						
Auto	1,637	827	810	138	90	49
Taxi/TNC	234	117	117	20	10	10
Subtotal Residential Development	1,872	944	927	158	99	59
Total Project Vehicle Trips	4,170	2,092	2,078	230	123	107
Proposed Project Net-New Vehicle Trips	**2,923**	**1,472**	**1,451**	**203**	**113**	**90**

Project Alternative D

Table D-1: Person Trips by Land Use

Land Use	Amount	Daily Person Trip Rate	P.M. Peak Hour Trip Rate	Daily Person Trips	P.M. Peak Hour Person Trips
EXISTING FACILITY					
Bus Maintenance and Storage[2]	400 employees	3.01	0.07	1,202	28
Bus Operations[2]	158 trolley coach parking spaces	1.91	0.03		
			Existing Person Trips	**1,202**	**28**
PROJECT ALTERNATIVE D					
Transit Facility					
Administrative & Office Space	46.2 KSF	15.7	1.4	725	65
Bus Maintenance & Storage	640 employees	3.0	0.07	1,923	45
Bus Operations	213 trolley coach parking spaces	1.9	0.03		
			Subtotal SFMTA Transit Facility Person Trips	2,648	110
Commercial Development					
Commercial/Retail	33ksf	150	13.5	4,950	446
			Total Proposed Project Person Trips	**7,598**	**555**
			Net-New Person Trips (Proposed Project less Existing))	**6,396**	**527**

Table D-2: Person Trips by Way of Travel

	Residential Development		Transit Facility	
Auto	1,282	115	1,868	57
Taxi/TNC	69	6	146	10
Transit	609	55	373	26
Walk	2,851	257	240	16
Bike	139	12	20	2

Vehicle Type	Daily Vehicle Trips	P.M. Vehicle Trips	Daily Vehicle Trips	P.M .Peak Hour Vehicle Trips
Auto	841	74	1,537	47
Taxi/TNC	45	8	177	20
Bus	-	-	407	5
Total Vehicle Trips	**887**	**82**	**2,121**	**72**

Table D-3: Vehicle Trips

Vehicle Type	Daily			P.M. Peak Hour		
	Total	In	Out	Total	In	Out
Transit Facility						
Auto	1,537	767	770	47	12	35
Taxi/TNC	355	177	177	20	10	10
Bus	407	204	204	5	2	4
Subtotal Transit Facility	2,299	1147	1,151	72	23	49
Existing Vehicles at Project Site	1247	620	627	27	9	18
Net-New Transit Facility Trips	1,051	527	524	45	14	31
Commercial Development						
Auto	841	411	431	74	33	40
Taxi/TNC	91	45	45	8	4	4
Subtotal Residential Development	932	456	476	82	37	44
Total Project Vehicle Trips	3,231	1,603	1,627	154	60	93
Proposed Project Net-New Vehicle Trips	**1,983**	**984**	**1,000**	**127**	**51**	**75**

APPENDIX F

Noise Measurement Calculation Details and Supporting Information

Appendix F-1: Noise and Vibration Assessment Methodology

Appendix F-2: Sound Level Measurement Data

Appendix F-3: Operational and Cumulative Traffic Data

Appendix F-4: Operational and Cumulative Traffic Noise Models Outputs

Appendix F-1

Noise and Vibration Assessment Methodology

NOISE AND VIBRATION ASSESSMENT METHODOLOGY

28 JULY 2020

POTRERO YARD MODERNIZATION PROJECT
San Francisco, California

For:
San Francisco Planning Department
San Francisco, California

18202-00.02709

BASELINE ENVIRONMENTAL CONSULTING
5900 Hollis Street, Suite D, Emeryville, CA 94608 | P: (510) 420-8686 | www.baseline-env.com

TRANSMITTAL

To: Peter Mye, SWCA

Date: 28 July 2020

Project No: 18202-00.02709

Subject: **Noise and Vibration Assessment Methodology for Potrero Yard Modernization Project, California**

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NOISE AND VIBRATION ASSESSMENT METHODOLOGY

28 JULY 2020

POTRERO YARD MODERNIZATION PROJECT
San Francisco, California

FOR:
San Francisco Planning Department
San Francisco, California

18202-00.02709

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NOISE AND VIBRATION ASSESSMENT METHODOLOGY

Potrero Yard Modernization Project

1. INTRODUCTION

At the request of the San Francisco Municipal Transportation Agency (SFMTA), Baseline Environmental Consulting (Baseline) will evaluate the potential noise and vibration impacts associated with implementation of the proposed Potrero Yard Modernization Project (proposed project). Baseline has prepared this document to describe the scope and methodology for the evaluation of noise and vibration impacts from construction and operational sources. Further, a cumulative analysis is described for construction (noise and vibration) and operation (noise). This assessment will be used to support environmental review of the proposed project under the California Environmental Quality Act (CEQA).

1.1 Project Description

The proposed project is an SFMTA capital project to rebuild and expand the Potrero Yard transit facility at 2500 Mariposa Street in San Francisco (Figure 1). The proposed project is a part of the SFMTA's 20-year Building Progress Program to expand and modernize its facilities to meet growing transportation demands and changing technologies. The project is proposed to accommodate bus maintenance, operation, and administrative uses within a modern, energy-efficient, and seismically-safe transit facility. The proposed program would incorporate modern bus technologies, facilitate the transition to a future all-electric battery-powered bus fleet, improve work conditions, increase the efficiency and timeliness of bus maintenance and repairs, and promote resiliency and flexibility in the face of climate change and natural disasters. The proposed project would also include a joint development program, with residential uses within and atop the transit facility podium and ground floor commercial/active uses along Bryant Street.

Under the proposed project, the existing bus storage yard (including the bus wash area and running repair station) and the maintenance and operations building (including the second-floor parking deck) would be demolished and replaced with one new, approximately 75- to 150-foot-tall and approximately 1,300,000-gross-square-foot structure. Commercial and residential uses would be along the perimeter of the podium on six floors, and three to seven floors of residential development atop the transit facility podium. The proposed project would consist of the following project components:

- The transit facility would be located in an approximately 75-foot tall podium with three transit levels. The proposed transit facility would include 52,000 square feet of administrative, training, and office space (e.g., offices, conference rooms, break rooms/kitchenettes, and training rooms). The remaining 671,000 square feet of space would include bus service, storage, and circulation space. The facility would be designed to include parking for 213 buses, 18 maintenance bays and maintenance support areas,

operations, an SFMTA operator training center, storage (parts and battery-electric infrastructure), administrative uses/common areas (e.g., offices, conference rooms, break rooms), and joint development uses. A total of 310 vehicle spaces would be provided: 63 spaces for the 40-foot-long buses, 150 spaces for the articulated 60-foot-long buses, and 97 parking spaces for large and standard non-revenue vehicles. The proposed transit facility would also include a basement to accommodate transit facility and joint development service functions.

- Residential apartments would include three to seven levels of up to 575 residential units developed atop the proposed transit facility.

- Commercial/retail uses would include up to approximately 33,000 square feet along the perimeter of the proposed replacement transit facility.

1.1.1 Construction

The SFMTA estimates that construction of the proposed project would occur in one phase and take three to four years to complete, with construction beginning in 2023 and building occupancy likely by the end of 2026. Demolition would last about 2 months and site preparation would last about 5 months. Installation of the foundation system would last about 2 months. Above-ground building construction, exterior finishing, and interior finishing would take a total of about 27 months, with some work overlap. Construction-related activities would typically occur Monday through Saturday, between 7 a.m. and 8 p.m., with most work occurring between Monday and Friday. Nighttime construction is anticipated for certain activities such as major concrete pours; however, construction on Sundays and major legal holidays is not anticipated. The most intensive concrete pour activities would occur during foundation work. It is anticipated that 3,300 concrete pours would occur during 42 work days within two months. It is also anticipated that most concrete pour activities would occur during daytime. If pouring concrete during nighttime is necessary, each nighttime concrete pour would not last longer than two successive nights. Throughout the construction period, construction staging would occur on site and on the surrounding sidewalks.

1.1.2 Operations

The SFMTA estimates that operation of the proposed project would begin as early as 2026. The proposed transit facility would operate 24 hours per day, 7 days a week. The proposed transit facility and residential apartments would include heating/ventilation/air conditioning systems. Upon commencement of operation, the SFMTA expects that the Potrero Yard facility would have parking space for 213 trolley and battery-electric buses and 97 non-revenue vehicles, a total of 18 maintenance bays, three bus wash areas, and an employment population of approximately 829 full-time equivalent persons, including 383 operators. The existing Potrero Yard transit facility, which consists of the maintenance and operations building and the bus storage yard, provides parking spaces for 158 trolley buses, 56 non-revenue vehicles and employee vehicles, 52 stripped parking spaces for trolley bus parking, and 10 additional non-revenue vehicles. It also includes 26 maintenance bays and a trolley bus wash rack along its

northern edge. The existing Potrero Yard transit facility has approximately 400 employees, including approximately 295 trolley bus operators.

1.1.3 Project Variant

The proposed project includes three proposed variants:

- Variant 1: Internal relocation of ramps from the north portion of site to a more southerly location allowing for the activation of the 17th Street frontage.

- Variant 2: Relocation of proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street, or other measures to mitigate potential conflicts with the bicycle track.

- Variant 3: Relocation of joint development lobby away from Mariposa Street to Hampshire Street, to reduce pedestrian/vehicular conflicts.

Each of the variants modify one limited feature or aspect of the proposed project and do not alter the development program. Therefore, noise and vibration emissions from the construction and operation of the proposed variants are anticipated to be similar to the proposed project.

1.2 Overview of Assessment Approach

In accordance with guidelines established by the City of San Francisco's General Plan, Article 29 of the San Francisco Police Code, California Department of Transportation (Caltrans), and the United States Federal Transit Administration (US FTA), the noise and vibration assessment will support the evaluation of potential noise and vibration impacts associated with construction and operation of the proposed project.[1,2,3] The noise and vibration assessment for the proposed project will include (additional details are provided in subsequent sections):

- *Description of existing noise conditions.* Baseline will collect up to two 24-hour noise measurements and up to four short-term 15-minute noise level measurements (the exact number and location of the measurements will be determined during the site reconnaissance based on the conditions observed in the field) in order to help characterize ambient noise conditions.

- *Identification of sensitive receptors.* Noise-sensitive receptors may include residents, hospitals, convalescent homes, schools, churches and sensitive wildlife habitat (e.g., nesting birds, marine mammals, protected fish species [for projects that generate underwater noise such as pile driving in San Francisco Bay] and the habitat of rare,

[1] City of San Francisco, 1996. General Plan: Environmental Protection Element. Available at: https://generalplan.sfplanning.org/I6_Environmental_Protection.htm. Accessed: April 20, 2020.

[2] Caltrans, 2013. Transportation and Construction Vibration Guidance Manual. September.

[3] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: April 20, 2020.

threatened or endangered species).[4] The proposed project would not include pile driving within 200 feet of the shoreline and therefore protected fish species are not considered in this analysis. Hotels and motels are also considered noise-sensitive receptors. Vibration-sensitive receptors may include structures (especially older masonry structures), people (especially residents, the elderly, and the sick), and equipment (e.g., magnetic resonance imaging equipment, high resolution lithographic, optical and electron microscopes).[5] Historic resources in the vicinity of the project site are: the Verdi Club at 2424 Mariposa Street, the SGI Cultural Center at 2450 17th Street, and the Leyser-Green Co. Building at 2401-25 17th Street.[6]

- *Assessment of noise impacts during construction.* This analysis will include an evaluation of estimated construction noise levels relative to the limits identified in Article 29 of the San Francisco Police Code and according to the guidelines from US FTA and San Francisco Planning Department.
- *Assessment of vibration impacts during construction.* This analysis will assess potential construction vibration effects according to the guidelines from US FTA and Caltrans.
- *Assessment of noise impacts during operation.* This analysis will compare estimated project noise levels during operation relative to the limits identified in Article 29 of the San Francisco Police Code.
- *Assessment of cumulative noise and vibration impacts during construction.*
- *Assessment of cumulative noise impacts during operation.*

The proposed project is not anticipated to generate substantial vibration during operation and therefore an assessment of operational vibration and cumulative operation is not proposed.

2. SOUND LEVEL MEASUREMENTS

2.1 Duration and Locations

Due to the COVID-19 stay at home order issued March 17, 2020, Baseline will use noise measurements from nearby noise studies to characterize exiting noise conditions per San Francisco Planning Department's guidance in an email dated May 14, 2020.[7] Nearby noise studies include 2000-2070 Bryant Street project and other studies that may become available. If permitted by the environmental review schedule, Baseline will collect sound level measurements in the vicinity of the proposed project to verify the accuracy of the existing noise

[4] Governor's Office of Planning and Research, *State of California 2017 General Plan Guidelines, Page 136*, 2017. Available at: http://www.opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf. Accessed April 20, 2020.

[5] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: April 20, 2020.

[6] VerPlanck, 2017. Historic Resource Evaluation, Potrero Trolley Coach Division Facility. October 2.

[7] Chelsea Fordham, Principal Planner at San Francisco Planning Department, 2020. Email correspondence with San Francisco Planning Department Qualified Environmental Consultant Pool and Acoustical Consultants. May 14.

conditions characterized with noise measurements from nearby noise studies. Long-term measurements (i.e., at least 24 hours in duration) will be collected at up to two locations, and short-term (i.e., 15-minute) measurements will be collected at up to four locations.

Figure 1 provides an illustration of the approximate proposed locations of these long-term and short-term measurement locations. The exact number and location of the measurements will be determined during the site reconnaissance based on the conditions observed in the field.

2.2 Measurement Equipment and Parameters

Consistent with Article 29 of the San Francisco Police Code (section 2901), Baseline will collect sound level measurements using Type 1[8] sound level meters, using slow response and "A" weighting. Consistent with Article 29 of the San Francisco Police Code (section 2902), the microphones will be positioned at least four feet above ground and protected from the effects of wind noises and other extraneous sounds by the use of appropriate windscreens. The meters will have been factory calibrated within the previous 12 months and will be field calibrated immediately prior to use.

Noise parameters collected during long-term (at least 24 hours in duration) measurements will include, at a minimum, L90[9], hourly Leq[10], and hourly L90. One-second sound level data will be collected for additional analysis, if warranted. 24-hour noise metrics (e.g.,) will be computed from hourly measurement data.

Noise parameters collected during short-term (15-minute) measurements will include, at a minimum, Leq, L90, and Lmax. One-second sound level data will be collected for additional analysis, if warranted.

2.3 Observations

Observations will be made during deployment and retrieval of long-term measurement equipment, as well as during the entire short-term measurements. Observations will document existing major sound sources, weather conditions, traffic observations, and other parameters.

2.4 Data Analysis

Measurement data will be used in the noise and vibration assessment outlined in this scope of work. For example, long-term measurements will be used to characterize the existing noise conditions at the project site and will be used to determine if the project site is consistent with the City's Land Use Compatibility guidelines. Short-term measurements are used to characterize existing noise from the project site and existing noise conditions at the nearest noise-sensitive receptors that may be affected by the proposed project.

[8] A type of sound level meter defined by American National Standards Institute Standard 1.4 as being to measure steady broadband noise in a reverberant sound field to an accuracy within 1.5 dB.

[9] L90 is a statistical noise level, which is exceeded during 90 percent of the measurement period.

[10] Equivalent Noise Level. The average A-weighted noise level during the measurement period.

3. CONSTRUCTION NOISE ASSESSMENT

The construction noise assessment will include the evaluation of noise from temporary construction-related equipment and activities. The assessment will include the following:

- evaluate noise from individual pieces of construction equipment (Appendix A) relative to the limits identified in Article 29 of the San Francisco Police Code (section 2907);
- for daytime construction, evaluate temporary noise emissions from construction equipment as received at the nearest noise-sensitive receptors per the US FTA's guidelines for assessing noise impact[11] and relative to the existing noise environment. Specifically, the assessment will determine if the noise level resulting from the simultaneous operation of the two loudest pieces of equipment (including impact equipment) would be greater than 90 dBA or 10 dBA above the background noise level at sensitive receptor locations;
- for nighttime construction, evaluate temporary noise emissions from construction equipment relative to the limits identified in Article 29 of the San Francisco Police Code (section 2908) and interior sound levels limits of 45 dBA[12] at residential receptors. This assumes a typical attenuation for exterior noise inside of a building with windows closed is 25 dBA.
- discuss the noise effects of construction trucks along haul routes qualitatively.

A description of the existing regulatory framework and guidelines is provided below.

3.1 Applicable Regulations

3.1.1 Article 29 of the San Francisco Police Code

The city regulates noise through Article 29 of the San Francisco Police Code, which states that the city's policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power. Article 29 of the San Francisco Police Code contains noise limits that are specific to construction activities in section 2907(a) and section 2908.

Section 2907(a) limits noise from construction equipment to 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions from this requirement include impact tools with approved mufflers, pavement breakers and jackhammers with approved acoustic shields, and construction equipment used in connection with emergency work.

[11] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: April 20, 2020.

[12] A-weighted decibel, a system for weighting measured sound levels to reflect the frequencies that people hear best.

Section 2908 prohibits nighttime construction (between 8:00 p.m. and 7:00 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless a special permit has been issued by the city.

3.1.2 United States Federal Transit Administration

Construction-related noise impacts will be assessed using the US FTA methodology for general quantitative noise assessment. This methodology calls for estimating a combined noise level from the simultaneous operation of the two noisiest pieces of equipment expected to be used in each construction phase. The daytime construction criterion is 90 dBA Leq at the nearest noise-sensitive receptors.[13]

3.2 Methodology for Construction Noise Assessment

A usage factor will be applied to each piece of equipment analyzed to account for the time that the equipment would likely be in use over the specified time period. Construction noise sources will be grouped according to construction phase, and the maximum hourly Leq will be determined using the two noisiest pieces of equipment which could be operated simultaneously in any given hour. These two noise sources will be added together at the same location, and the corresponding noise levels at the nearest receptors to the project site will be then predicted based on quantitative calculations that considered the approximate distance between the nearest receptors and the noise sources. The estimated noise levels at the nearest receptors are based on the attenuation of noise with distance, which will decrease by 6 dB for each doubling of distance. The calculations do not consider the attenuation potentially provided by barriers (e.g., intervening walls, buildings and other structures) due to variations in the height and composition of such barriers. The attenuation from barriers will be described qualitatively, if appropriate.

4. CONSTRUCTION VIBRATION ASSESSMENT

The construction vibration assessment will include the evaluation of vibration from temporary construction-related equipment and activities. The assessment will evaluate vibration from each piece of construction equipment as received at the nearest vibration-sensitive receptors:

- relative to the limits identified in the US FTA's guidelines for assessing vibration disturbance to people or interference with vibration-sensitive equipment (if any);[14] and

[13] Although this Federal Transit Administration standard is specifically applicable to residential receptors, this standard can be applied to other noise-sensitive receptors including school students and hospital patients.

[14] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: April 20, 2020.

- relative to the limits identified in the Caltrans guidelines for assessing vibration damage to buildings.[15]

General information on groundborne vibration and a description of existing regulatory framework and guidelines is provided below.

4.1 General Information on Groundborne Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment. Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or as root-mean-square (RMS) velocity. PPV is defined as the maximum instantaneous peak of the vibration signal, while the RMS value can be considered an average value over a given time interval. PPV is appropriate for evaluating potential damage to buildings, but it is not suitable for evaluating human response to vibration because it takes the human body time to respond to vibration signals. The response of the human body to vibration is dependent on the average amplitude of a vibration. Thus, RMS is more appropriate for evaluating human response to vibration. PPV and RMS are normally described in units of inches per second (in/sec), and RMS is also often described in vibration decibels (VdB).

A description of the existing regulatory framework and guidelines is provided below.

4.2 Regulations and Guidelines

4.2.1 US FTA

US FTA recommends vibration thresholds to prevent disturbance of occupants, which are presented in Table 1 below.

Table 1 Indoor Groundborne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB)		
	Frequent Events[a]	**Occasional Events[b]**	**Infrequent Events[c]**
Special Buildings	65-72	65-80	65-80
Category 1: Buildings where vibration would interfere with interior operations.	65	65	65

[15] Caltrans, 2013. Transportation and Construction Vibration Guidance Manual. September.

Category 2: Residences and buildings where people normally sleep.	72	75	80
Category 3: Institutional land uses with primarily daytime use.	75	78	83

Notes:
[a] More than 70 vibration events of the same source per day.
[b] Between 30 and 70 vibration events of the same source per day.
[c] Less than 30 vibration events of the same source per day.
Source: Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: April 20, 2020.

4.2.2 Caltrans

Caltrans recommends vibration thresholds to prevent damage to buildings, which are presented in Table 2 below.

Table 2 Vibration Damage Impact Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans, 2013. Transportation and Construction Vibration Guidance Manual. September.

4.3 Methodology for Construction Vibration Assessment

The vibration level from each piece of construction equipment as received at the nearest vibration-sensitive receptors will be predicted based on quantitative calculations that considered the approximate distance between the nearest receptors and the construction equipment. The following propagation adjustment will be applied to estimate vibration levels in RMS, which is based on the FTA methodology:

RMS2 = RMS1 – 30 Log10 (D2/D1)
Where:
RMS1is the reference vibration level at a specified distance.
RMS2 is the calculated vibration level.
D1 is the reference distance.
D2 is the distance from the equipment to the receiver.

For this assessment, vibration levels in RMS would be calculated at category 1 buildings (presented in Table 1 above) during both daytime and nighttime construction. Vibration levels in RMS would also be calculated at category 2 buildings during nighttime construction if necessary.

The following propagation adjustment will be applied to estimate vibration levels in PPV, which is based on the Caltrans methodology:

$PPV2 = PPV1 \times (D1/D2)^n$
Where:
PPV1 is the reference vibration level at a specified distance.
PPV2 is the calculated vibration level.
D1 is the reference distance.
D2 is the distance from the equipment to the receiver.
n is related to the attenuation rate through ground.

5. OPERATIONAL NOISE ASSESSMENT

The operational noise assessment will:

- Evaluate noise relative to the limits identified in Article 29 of the San Francisco Police Code. The limits are based on both absolute permanent increases over existing conditions due to operation of the proposed project (section 2909[a], [b], and [c]) and interior sound levels limits at residential receptors (section 2909[d]).
- Evaluate if the proposed project would result in a substantial permanent increase in traffic noise levels. Traffic noise increase would be evaluated to determine if the proposed project would result in an increase of:
    - 3 dBA Ldn or more where the existing and/or resulting noise levels are in any category other than “Satisfactory” according to the “Land Use Compatibility Guidelines for Community Noise” figure;

- 5 dBA Ldn or more where the existing and/or resulting noise levels are “Satisfactory” according to the “Land Use Compatibility Guidelines for Community Noise” figure.

A description of the existing regulatory framework and guidelines is provided below.

5.1 Regulations and Guidelines

5.1.1 Article 29 of the San Francisco Police Code

Article 29 of the San Francisco Police Code contains noise limits that are specific to operational activities in section 2909.

- Section 2909(a) establishes a limit of 5 dBA above the local ambient noise level at residential receiving properties.

- Section 2909(b) establishes a limit of 8 dBA above the local ambient noise level at commercial or industrial receiving properties.

- Section 2909(c) establishes a limit of 10 dBA above the local ambient noise level at a distance of 25 feet or more at public receiving properties.

- Section 2909(d) establishes an interior noise limit for fixed noise sources at the nearest sensitive receptor of 45 dBA at night (10:00 p.m. to 7:00 a.m.) or 55 dBA during the day (7:00 a.m. to 10:00 p.m.) measured from any bedroom or living room.

5.1.2 San Francisco General Plan

The Environmental Protection Element of the San Francisco General Plan contains a “Land Use Compatibility Guidelines for Community Noise” figure for determining the compatibility of various new uses with different noise levels. These guidelines indicate maximum acceptable noise levels for various land uses. Although this figure presents a range of noise levels that are considered compatible or incompatible with new uses, the maximum “satisfactory” noise level is 60 dBA (Ldn) for residential and hotel uses; 65 dBA (Ldn) for school classrooms, libraries, churches, and hospitals; 70 dBA (Ldn) for playgrounds, parks, office uses, retail commercial uses, and noise-sensitive manufacturing/ communications uses; and 77 dBA (Ldn) for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities.

5.2 Methodology for Operational Noise Assessment

The operational noise impact assessment will be based on on-site sound sources that could result in a substantial permanent increase in noise levels at noise-sensitive receivers in the vicinity of the proposed project. The assessment of on-site noise will include heating/ventilation/air conditioning systems. It is anticipated that the proposed project would not intensify noise-generating activities on-site, which consist of bus maintenance activities (i.e. repair and wash), and vehicle movements because there will be no outdoor yard for the proposed project and vehicle movements will mostly occur in an enclosed space, except when

the facility doors need to be open for vehicles entering or existing the facility. Specifically, the facility doors at the southwestern portion of the facility would need to remain open for buses exiting the facility from 5 AM to 9 AM and the facility doors at the southeastern portion of the facility need to remain open for buses entering the facility from 4 PM to 8 PM. Therefore, the assessment of on-site noise from bus maintenance activities and bus idling would be discussed qualitatively.

Noise emissions generated by off-site sources that are directly attributable to the proposed project would include project-related traffic traveling on existing roadways in the proposed project vicinity. The assessment of increases in traffic noise will be based on a review of traffic volumes along area roadways under "existing" and "existing+project" scenarios. A traffic noise prediction model (e.g., Federal Highway Administration's Traffic Noise Model Version 2.5 or similar) will be used to estimate traffic noise increase.

6. CUMULATIVE ANALYSIS

Cumulative analyses are proposed for construction noise and vibration, as well as operational noise, specifically due to increases in traffic along area roadways. Reasonably foreseeable projects in the vicinity of the proposed project will be identified through coordination with the City, including approved and pending projects. Details regarding construction activities and schedules for reasonably foreseeable projects are anticipated to be either readily available through the City's online publications, or may be requested directly. The cumulative assessment of construction noise and vibration will be completed for nearby sensitive receptors.

Cumulative assessment of operational traffic noise will be based on data provided within the project's traffic study for the following scenarios: existing, existing+project, cumulative (consistent with the project's traffic analysis horizon year), and cumulative+project.

7. CONTROL MEASURES

Baseline will evaluate the project's construction and operational noise and vibration impacts and recommend control measures required to meet applicable limits, if feasible. Control measures may include, but not limited to:

- Maintain buffer distances or erect noise barriers.
- Limit the use of certain types of construction equipment.
- Notify nearby sensitive receptors prior to the implementation of certain construction activities.
- Prepare a construction noise control plan.

8. DELIVERABLES AND COORDINATION

Baseline will not prepare a stand-alone noise technical background study. Instead, Baseline will work with SWCA Environmental Consultants to document the results of the noise and vibration assessment in the draft Environmental Impact Report (EIR) for the proposed project, with technical documentation included as part of the EIR appendix. The noise technical appendix will provide details that are not required within the EIR section, such as hourly sound level measurement data and charts, details of traffic noise modeling including sound level output data and traffic volumes, and calculation details for construction and operational impact analyses. Baseline will respond to two rounds of comments following two separate rounds of review by the San Francisco Planning Department's Environmental Planning Division.

APPENDIX A

PRELIMINARY PROJECT-SPECIFIC CONSTRUCTION INFORMATION

Preliminary Project-Specific Construction Information

	Demolition			Site Preparation, Grading, and Piling			Foundation			Building Construction			Paving			Architectural Coating		
Total Work Days	42			110			42			546			20			20		
Total Workers per Day[1]	30			50			100			450			25			30		
Total Vendor Truck Trips[2]	840			550			1050			13650			60			100		
Total Soil Haul Truck Trips[3]	5000			20044			200			100			20					
Total Concrete Truck Trips[4]	20			270			3300			2500			50					
Equipment	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**
Aerial Lifts																		
Air Compressors	2	8	Diesel	1	8	Diesel	1	8	Diesel	1	2	Diesel	1	4	Diesel			
Air Compressors	2	8	Electric	2	8	Electric	2	8	Electric	10	8	Electric				1	8	Electric
Bore/Drill Rigs	1	8	Electric															
Cement and Mortar Mixers							1	8	Diesel	1	6	Diesel	1	10	Diesel			
Concrete/Industrial Saws	1	8	Diesel				1	1	Diesel									
Cranes	2	8	Diesel	2	8	Diesel	1	4	Diesel	1	1	Diesel	1	2	Diesel			
Crawler Tractors																		
Crushing/Proc. Equipment																		
Dumpers/Tenders																		
Excavators[5]	2	8	Diesel	6	8	Diesel	2	8	Diesel	2	2.64	Diesel						
Forklifts	1	4	Propane	1	4	Propane	2	8	Propane	3	4	Propane				1	8	Propane
Generator Sets	1	4	Diesel	4	8	Diesel	4	8	Diesel	1	2.34	Diesel						
Graders				2	6	Diesel	1	4	Diesel									
Off-Highway Tractors																		
Off-Highway Trucks																		
Other Construction Equipment	1	1	Electric	15	8	Electric	15	8	Electric	30	8	Electric						
Other General Industrial Equipment							1	8	Diesel									
Other Material Handling Equipment				1	8	Electric	1	8	Electric	2	8	Electric	1	4	Electric			
Pavers													1	8	Diesel			
Paving Equipment													2	8	Diesel			
Plate Compactors				2	8	Propane	2	8	Propane	1	2.64	Propane	4	8	Propane			
Pressure Washers										1	1	Electric				1	1	Electric
Pumps	54	8	Electric	54	8	Electric	54	8	Electric	54	4	Electric	2	8	Electric	2	8	Electric
Rollers				1	8	Diesel	1	6	Diesel				2	6	Diesel			
Rough Terrain Forklifts	1	6	Diesel	2	4	Diesel	2	8	Diesel	2	4							
Rubber Tired Dozers	2	8	Diesel	2	8	Diesel	1	4	Diesel	1	2.64	Diesel	1	8	Diesel			
Rubber Tired Loaders	1	8	Diesel	2	8	Diesel	1	2	Diesel									
Scrapers													1	8	Diesel			
Signal Boards	4	8	Electric	4	8	Electric	4	8	Electric									
Skid Steer Loaders	1	8	Propane	1	2	Propane												
Surfacing Equipment																		
Sweepers/Scrubbers																		
Tractors/Loaders/Backhoes	3	8	Diesel	5	8	Diesel	3	8	Diesel	3	4	Diesel	1	8	Diesel			
Trenchers				1	4	Diesel												
Welders				2	4	Electric	2	8	Electric	33	5	Electric						
Slant Pile Drill				1	8	Diesel												
Soil Mix Drill Rig				1	8	Diesel												
Grout Plant				1	8	Diesel												
Soldier Pile Rig[6]				1	8	Diesel												
Tie Back Drill				1	8	Diesel												
Air Compressor for Tie Back Rig				1	8	Diesel												
Concrete Truck	1	2	Diesel	2	6	Diesel	7	12	Diesel	2	8	Diesel	1	4	Diesel			
Concrete Boom Pump	1	2	Diesel	1	4	Diesel	4	4	Diesel	3	3	Diesel	1	4	Diesel			
Scissor Lift							5	10	Electric	50	5	Electric	2	8	Electric	4	8	Electric
Tower Crane				1	8	Electric	2	10	Electric	4	12	Electric	4	2	Electric	4	2	Electric
Hoist (Construction Elevator)				1	4	Electric	1	8	Electric	2	12	Electric	2	12	Electric	2	12	Electric
Light Plant	4	6	Propane	4	6	Propane	4	6	Propane				2	8	Propane			
Recycling Plant	1	8		1	2													

Notes:

[1] In accordance with CalEEMod, assume single vehicle occupancy, a round trip distance of 21.6 miles, and a fleet mix of 50 percent light-duty auto, 25 percent light-duty truck type 1, and 25 percent light-duty truck type 2.

[2] In accordance with CalEEMod, assume a round trip distance of 14.6 miles and a fleet mix of 100 percent heavy heavy-duty trucks.

[3] In accordance with CalEEMod, assume a fleet mix of 100 percent heavy heavy-duty trucks. Conservatively assume a round trip distance of 110 miles to the Altamont Landfill in Livermore, which is near the border of the San Francisco Bay Area Air Basin.

[4] In accordance with CalEEMod, assume a round trip distance of 40 miles and a fleet mix of 100 percent heavy heavy-duty trucks.

[5] For the noise and vibration analysis, it will be conservatively assumed that excavators will be equipped with a hydraulic breaker (also known as a hoe ram) during bedrock removal.

[6] For the noise and vibration analysis, it will be conservatively assumed that impact pile driver methods will be used for pile installations.

FIGURE

Noise Measurement Locations

Figure 1

Base: Google Aerial Map, 2020.

Legend

- Project Site
- ST-1 — Short-term noise measurement locations
- LT-1 — Long-term noise measurement locations

0 200 Feet N

Potrero Yard Modernization Project
San Francisco

BASELINE ENVIRONMENTAL CONSULTING

18202-00.02709 Figure 1 04/27/20

Appendix F-2

Sound Level Measurement Data

Overview: Technical memorandum includes ambient noise measurement data collected for the 2000-2070 Bryant Street Project. Due to changes in traffic patterns and reductions in transit use in response to COVID-19 and the subsequent issuance of Mayor's Executive Directive requiring Shelter at Home protocols and ensuing business opening efforts, ambient noise measurements during this period were not conducted for the Potrero Yard modernization Project. Instead, ambient noise measurements collected for the 2000-2070 Bryant Street Project were used to characterize the existing ambient noise environment in the vicinity of the project site for the Potrero Yard modernization Project.

Memorandum

Date:	March 26, 2015
To:	Chris Thomas San Francisco Planning Department, Environmental Planning 1650 Mission Street, Suite 400 San Francisco, CA 94103
From:	Dave Buehler and Cory Matsui, ICF International
Subject:	**2000-2070 Bryant Street Project – Final Noise Study Case No. 2013.0677E**

Introduction

This memorandum has been prepared to document a noise analysis conducted for the 2000-2070 Bryant Street Project (proposed project). The proposed project involves the demolition of seven existing buildings and construction of a six-story, 68-foot-tall, approximately 286,369 gross square-foot (gsf) mixed-use residential and commercial building with a ground-level garage. The mixed-use building would provide approximately 274 dwelling units and 5,415 gsf of commercial retail space.

The project site is located within the Eastern Neighborhoods Area Plan in the Mission District neighborhood at 2000 through 2070 Bryant Street, 2815 18th Street, and 611 Florida Street. The Eastern Neighborhoods Area Plan was adopted in December 2008, in part to support residential mixed-use development in some areas previously zoned for industrial uses, and also to preserve adequate space for existing and future PDR employment and businesses.

The Eastern Neighborhoods Area Plan Program Environmental Impact Report (PEIR) identifies several mitigation measures related to noise. This memo has been prepared to demonstrate compliance with Mitigation Measure F-4, Siting of Noise-Sensitive Uses, which applies to the proposed project because it would introduce noise-sensitive uses (i.e., residential) to the project site. This mitigation measure states that an analysis will be prepared that demonstrates "with reasonable certainty that Title 24 standards, where applicable, can be met, and that there are no particular circumstances about the proposed project site that appear to warrant heightened concern about noise levels in the vicinity."

Compliance with Mitigation Measure F-6 from the PEIR, which applies to open space areas of new land use development, is demonstrated in this memo as well. Mitigation Measure F-6 states that open space is required to be protected from existing ambient noise levels that could prove annoying or disruptive to users of the open space, to the maximum feasible extent.

Noise Terminology

Terminology relevant to the noise survey results and analysis are included in **Table 1**.

Table 1. Definition of Sound Measurements

Sound Measurements	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Maximum Sound Level (L_{max})	The maximum sound level measured during the measurement period.
Minimum Sound Level (L_{min})	The minimum sound level measured during the measurement period.
Equivalent Sound Level (L_{eq})	The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-Exceeded Sound Level (L_{xx})	The sound level exceeded *xx* % of a specific time period. L_{10} is the sound level exceeded 10% of the time. L_{90} is the sound level exceeded 90% of the time. L_{90} is often considered to be representative of the background noise level in a given area.
Day-Night Level (L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Frequency: Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
Sound Transmission Class (STC)	A rating of how well a building partition attenuates airborne sound. STC is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations.
Outdoor-Indoor Transmission Class (OITC)	A rating of how well a building partition attenuates airborne sound between outdoor and indoor spaces in a structure.

Sound Transmission Class and Outdoor-Indoor Transmission Class Ratings

An Outdoor-Indoor Transmission Class (OITC) rating specifies how well a building partition attenuates airborne sound between outdoor and indoor spaces in a structure, such as noise from cars or airplanes. A Sound Transmission Class (STC) rating specifies how well an interior building partition attenuates airborne sound, such as noise from office equipment or human voices (PPG 2015). STC ratings are more widely used than OITC ratings to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. OITC and STC ratings represent the decibel reduction in noise that is achieved by a partition; thus, a higher rating is more desirable (PPG 2015).

Tests of various wood stud walls indicate OITC ratings from a low of 25 to a high of 44, which corresponds to a sound level reduction in the range of 25 to 44 dBA. Increasing the stud spacing, adding resilient channels, or using a staggered stud configuration all significantly increased the rating of the wall. Combining one of these improvements with additional surface layers to increase their mass produces further improvements in the overall sound insulation (Bradley and Birta 2000). Use of metal studs typically adds 2 dB to STC values, further attenuating interior noise levels (Hoover and Keith 2000). Windows typically have OITC ratings in the range of about 29 to 33 depending on the configuration (PPG 2015). **Table 2** summarizes typical STC and OITC ratings.

Table 2. Typical STC and OITC Ratings

Product Type	STC	OITC	Reference Source
Monolithic Glass			
¼" monolithic glass	31	29	[1]
½" monolithic glass	36	33	[1]
Sealed Insulating Glass Units			
¼" glass + ½" air + ¼" glass	35	28	[1]
¼" glass + 1" air + ¼" glass	37	30	[1]
Laminated Glass with 0.030 Resin Interlayer			
1/8" glass / resin / 1/8" glass	35	31	[1]
¼" glass / resin / ¼" glass	38	34	[1]
Sealed Insulating Glass with 0.030 Resin Interlayer			
1/8" glass / resin / 1/8" glass + ½" air + ¼" glass	39	31	[1]
1/8"glass / resin / ¼"glass + ½" air + ¼" glass	40	31	[1]
Wall Assemblies			
½" gypsum board (both sides) screwed to 3-5/8" metal studs	36	-	[1]
6" lightweight concrete block, two coats of paint each side	46	-	[1]
4" hollow lightweight masonry block, plastered on both sides	48	-	[1]
8" dense concrete block wall, two coats of paint each side	52	-	[1]
Double layer of gypsum wall board, both sides, 3-5/8" metal studs, 3" insulation	54	-	[1]
½-inch wood board/6-inch wood stud/½-inch gypsum board with glass fiber insulation	-	25	[2]
½-inch wood board/6-inch wood stud/½-inch gypsum board with glass fiber insulation add expanded polystyrene and stucco on one side	-	27	[2]
½-inch wood board/6-inch wood stud/½-inch gypsum board with glass fiber insulation add cement stucco on one side	-	29	[2]

Product Type	STC	OITC	Reference Source
½-inch wood board/6- inch wood stud/½-inch gypsum board with glass fiber insulation add brick on one side	-	40	[2]
4-inch thick concrete	45	41	[3]
6-inch thick hollow-core dense concrete block or masonry	43	39	[3]
Sources: [1]PPG 2015, [2]Bradley and Birta 2000, [3]Hoover and Keith 2000.			

Noise Survey Methodology

Ambient noise levels in the project area were measured at three long-term (48 hours) sites and four short-term (15 minute) sites. Long-term measurements were conducted with three Piccolo Type 2 integrating sound level meters. Short-term measurements were conducted with a Larson Davis Type 1 integrating sound level meter.

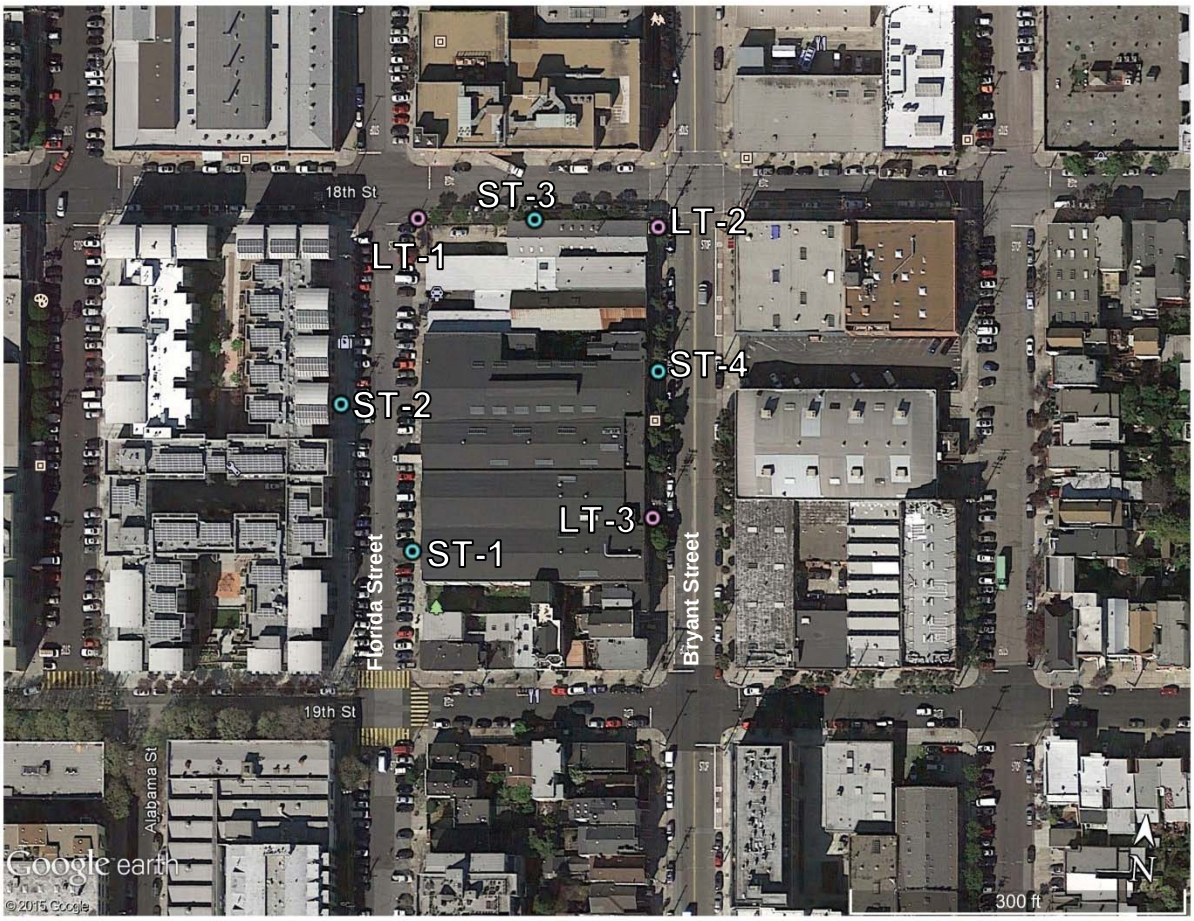
Long-Term Measurements

Long-term measurements were conducted by affixing the sound meters to utility poles in the project area at heights of approximately 10-12 feet above the street level. The meters continuously measured sound levels over a 48-hour period from Monday, December 8, 2014 to Wednesday, December 10, 2014. All relevant noise data metrics were recorded. The locations of the long-term measurement sites are described in **Table 3** and shown in **Figure 1**.

Short-Term Measurements

Short-term measurements were completed on Wednesday, December 10, 2014 at four locations in the vicinity of the project area at street level. Measurements were conducted for 15-minute intervals at each measurement location, with the relevant noise data metrics being recorded. **Table 4** below describes the locations of the 4 short-term measurement sites, and **Figure 1** shows the locations of the short-term sites.

Figure 1. Long-Term and Short-Term Noise Monitoring Sites



Noise Survey Results

Table 3 and **Table 4** present the results of the long-term and short-term noise measurement surveys, respectively.

As shown in **Table 3** below, L_{dn} values for the long-term measurement sites are between approximately 69 dBA and 72 dBA. The site with the highest L_{dn}, LT-2, is located at the intersection of Bryant Street and 18th Street, which is a busy intersection. LT-3 has an L_{dn} value that is less than LT-2 (approximately 70 dBA), as it is located adjacent to only one street and experiences less vehicle acceleration noise from vehicles than the intersection of Bryant Street and 18th Street. LT-1 has the smallest L_{dn} value due to its location at the less active intersection of 18th Street and Florida Street.

Table 3. Long-Term Noise Measurements Results – Monday, 12/8/2014 to Wednesday 12/10/2014

Site #	Location	L_{dn}
LT-1	Florida St & 18th Street, Southeast Corner of Intersection	69
LT-2	Bryant St & 18th Street, Southwest Corner of Intersection	72
LT-3	West Side of Bryant Street. 163 feet north of Bryant St &19th St Intersection	70
Notes: Measurements began between 10:30 – 11:00 AM on 12/8/2014 and ended at approximately 11:00 AM on 12/10/2014. All values are in units of dBA		

As shown in **Table 4**, L_{eq} values from the short-term noise measurements range from 57 dBA to 65 dBA. The noisiest measurement sites are located on Bryant Street and on 18th Street, while the measurement sites on Florida Street resulted in lower noise levels. Noise sources during the short-term measurements included cars and medium-duty trucks, idling delivery vehicles, car-security system noises, parking garage alert sirens, and human voices.

Table 4. Short-Term Noise Measurements Results – Wednesday, 12/10/2014

Site #	Location	L_{eq}	L_{max}	L_{min}	L_{10}	L_{33}	L_{50}	L_{90}
ST-1	681 Florida Street	56.7	57.6	49.9	59.6	55.9	54.4	51.7
ST-2	650-D Florida Street	57.8	76.1	50.4	60.3	55.3	53.8	51.6
ST-3	Opposite side of the street from 2828 18th Street	62.4	81.5	52.1	63.2	59.4	57.8	54.6
ST-4	West side of Bryant Street, 115 feet south of 18th Street and Bryant Street intersection	64.9	78.0	55.3	68.0	64.0	61.6	57.1
Notes: Measurements were conducted between 11:45 AM and 1:30 PM on 12/10/2014. All values are in units of dBA								

Title 24 of the California Code of Regulations

Section 1207.4 of Title 24 of the California Code of Regulations states the following:

Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (L_{dn}) or the community noise equivalent level (CNEL).

Proposed Wall Assemblies

The project sponsor has provided that following information concerning the exterior wall assemblies:

Assembly 1: Non-load bearing exterior walls

- Wood Siding (1-hr & 2-hr assembly)
- Brick (1-hr & 2-hr assembly)
- Tilt-up Walls w/ Siding at Southwest Property Line (1-hr & 2-hr assembly)
- Storefront
- Board Form Concrete (1-hr assembly only)

Assembly 2: Brick Building

- ½" thin brick exterior over two coat cement plaster (scratch and brown) over 1/2" plywood, 2x6 studs at 16" O.C. with acoustical insulation and one (1) layer 5/8" type X interior gypsum board.
- At exterior load bearing wall conditions (2-Hour Rated), (1) additional layer of 5/8" dens glass is required at the exterior and one (1) additional layer of 5/8" Type X interior gypsum board in addition to the above.

Assembly 3: Wood Building

- Cement Fiber Siding over 5/8" fiberglass sheathing, 2x6 studs at 16" O.C. with acoustical insulation and one (1) layer 5/8" Type X interior gypsum board.
- At exterior load bearing wall conditions (2-hour rated), an additional layer of 5/8" fiberglass sheathing and an additional layer of 5/8" gypsum board is required at the exterior in addition to the above.

Assembly 4: Blind Walls

- ½" plywood sheathing (or similar blind wall siding) 5/8" fiberglass sheathing, 2x6 studs at 16" O.C. with acoustical insulation and two (2) layers 5/8" Type X interior gypsum board.
- At exterior load bearing wall conditions an additional layer of 5/8" fiberglass sheathing is required at the exterior in addition to the above.

Summary: Comparison to Title 24 Requirements

The highest L_{dn} value measured during the long term noise measurements was 72 dBA L_{dn}. This means a rating of at least 27 OITC is needed for the window and wall assemblies to achieve an interior sound level of 45 dBA L_{dn}.

The types of window assemblies to be used are not known at this time. However, all of the window types shown in **Table 2** would provide a rating of at least OITC 27, so it is reasonable to assume the window assemblies for the proposed project will provide a rating of at least OITC 27, assuming windows are closed. As such, the design for the building shell and mechanical design must specify a ventilation or air conditioning system to provide adequate ventilation.

Wall Assembly 1 is based on a concrete tilt up wall, which is expected to perform at least as well as 4-inch thick concrete indicated in **Table 2** (OITC 41). Wall Assemblies 2, 3, and 4 are expected to provide a rating of at least 27 OITC based on the similar assemblies indicated in **Table 2**.

This analysis indicates that the proposed window and wall assemblies as currently proposed have reasonable certainty of meeting the Title 24 interior sound level standard of 45 dBA L_{dn}. The attenuation from window and wall assemblies rated at OITC 27 or higher (see **Table 2**) would ensure that the highest measured noise level of 72 dBA L_{dn} is attenuated by at least 27 dBA to meet the 45 dBA L_{dn} standard. The performance of the final wall and window assembly designs must be confirmed in the formal Title 24 report.

With regard to the open space areas proposed as part of the project, noise levels in these areas would not be considered to be annoying or disruptive. The U.S. Department of Housing and Urban Development considers noise at residential land uses to be acceptable at levels of 65 dBA L_{dn} or less. Thus, demonstrating that noise levels at the 2nd-level outdoor courtyard and rooftop terrace at the project site would be 65 dBA L_{dn} or less would ensure compliance with Mitigation Measure F-6 of the PEIR.

At the noisiest area of the project site, the intersection of Bryant Street and 18th Street, the noise level was measured at 72 dBA L_{dn}. The eastern 2nd level courtyard would be adjacent to this intersection, but the courtyard would be shielded from noise by the project buildings. While some noise would be loud enough to propagate over the buildings and into the courtyard, the shielding effect provided by the project building would be more than sufficient to reduce noise by 7 dBA, from 72 dBA L_{dn} to 65 dBA L_{dn} or less.

The proposed rooftop terrace would be located at the northwest corner of the project site and near measurement site LT-1, where L_{dn} noise was measured to be 69 dBA. Consequently, a reduction in noise of at least 4 dBA would be needed between the street level and rooftop terrace in order for

noise to be considered acceptable. The rooftop terrace would be located on the top of the sixth story of the project building, 68 feet above the street level. A distance of 68 feet between the noise on the street level and the rooftop terrace, along with the shielding provided by the top edge of the safety barrier, there would be sufficient noise attenuation to reduce noise levels by at least 4 dBA, from 69 dBA L_{dn}, to 65 dBA L_{dn} or less. Thus, noise at both the 2nd level courtyard and rooftop terrace would not be considered annoying or disruptive, which would ensure that the project is in compliance with Mitigation Measure F-6 from the PEIR.

References:

Bradley and Birta 2000. *Laboratory measurements of the sound insulation of building façade elements*. IRC Internal Report, IRC IR-818.

Hoover and Keith 2000. *Noise control for buildings and manufacturing plants*. Houston, TX.

PPG Technologies. Website accessed January 15, 2015. http://educationcenter.ppg.com/glasstopics/determining_the_right_glass.aspx

Appendix F-3

Operational and Cumulative Traffic Data

Overview: Data provided by Fehr and Peers for the Potrero Yard Modernization Project, which includes traffic volumes along 22 roadway segments during the PM peak hour.

Potrero Yard Modernization Project
Operational and Cumulative Traffic Data and Model Outputs

Roadway	Location	Direction	Existing Volume - No Project		Existing Volume - Plus Project		Cumulative Volume - Plus Project	
			PM Peak Hour Volume	Approximate Daily Volume	PM Peak Hour Volume	Approximate Daily Volume	PM Peak Hour Volume	Approximate Daily Volume
16th St	East of Bryant St	EB	570	5,700	570	5,700	660	6,600
		WB	1,030	10,300	1,033	10,330	1,110	11,100
	West of Bryant St	EB	490	4,900	501	5,010	580	5,800
		WB	949	9,490	955	9,550	1,040	10,400
	East of Potrero Ave	EB	579	5,790	437	4,370	710	7,100
		WB	779	7,790	797	7,970	820	8,200
	West of Potrero Ave	EB	570	5,700	570	5,700	660	6,600
		WB	1,030	10,300	1,033	10,330	1,110	11,100
17th St	East of Bryant St	EB	274	2,740	291	2,910	340	3,400
		WB	372	3,720	376	3,760	500	5,000
	West of Bryant St	EB	272	2,720	287	2,870	330	3,300
		WB	274	2,740	282	2,820	380	3,800
	East of Hampshire St	EB	287	2,870	290	2,900	350	3,500
		WB	386	3,860	386	3,860	520	5,200
	West of Hampshire St	EB	274	2,740	291	2,910	340	3,400
		WB	372	3,720	376	3,760	500	5,000
Mariposa St	East of Bryant St	EB	114	1,140	158	1,580	210	2,100
		WB	185	1,850	214	2,140	370	3,700
	West of Bryant St	EB	113	1,130	128	1,280	190	1,900
		WB	125	1,250	133	1,330	230	2,300
	East of Hampshire St	EB	111	1,110	163	1,630	220	2,200
		WB	163	1,630	217	2,170	370	3,700
	West of Hampshire St	EB	189	1,890	247	2,470	320	3,200
		WB	163	1,630	234	2,340	360	3,600
	East of York St	EB	189	1,890	247	2,470	320	3,200
		WB	163	1,630	234	2,340	360	3,600
	West of York St	EB	114	1,140	158	1,580	210	2,100
		WB	185	1,850	214	2,140	370	3,700
Bryant St	North of 16th St	NB	489	4,890	504	5,040	560	5,600
		SB	329	3,290	349	3,490	410	4,100
	South of 16th St	NB	420	4,200	438	4,380	520	5,200
		SB	280	2,800	311	3,110	360	3,600
	North of 17th St	NB	420	4,200	438	4,380	520	5,200
		SB	280	2,800	311	3,110	360	3,600
	South of 17th St	NB	317	3,170	338	3,380	420	4,200
		SB	304	3,040	334	3,340	410	4,100
	North of Mariposa St	NB	317	3,170	338	3,380	420	4,200
		SB	304	3,040	334	3,340	410	4,100
	South of Mariposa St	NB	287	2,870	287	2,870	330	3,300
		SB	328	3,280	328	3,280	440	4,400
Potrero Ave	North of 16th St	NB	553	5,530	565	5,650	620	6,200
		SB	1,089	10,890	1,101	11,010	1,400	14,000
	South of 16th St	NB	716	7,160	752	7,520	820	8,200
		SB	961	9,610	991	9,910	1,230	12,300
Hampshire St	North of 17th St	NB	5	50	5	50	20	200
		SB	18	180	18	180	30	300
	South of 17th St	NB	39	390	45	450	80	800
		SB	59	590	76	760	110	1,100
	North of Mariposa St	NB	39	390	45	450	80	800
		SB	59	590	76	760	110	1,100
	South of Mariposa St	NB	49	490	49	490	70	700
		SB	81	810	81	810	130	1,300
York St	North of Mariposa St	NB	5	50	129	1,290	140	1,400
		SB	-	-	94	940	100	1,000
	South of Mariposa St	NB	39	390	48	480	70	700
		SB	36	360	43	430	70	700

Potrero Yard Modernization Project
Operational and Cumulative Traffic Data and Model Outputs

	Intersection	Heavy Vehicle %				Bus %				Non-Bus Heavy Vehicle %			
		NB	SB	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB
1	16th St/ Bryant St	3%	3%	8%	4%	1%	1%	1%	1%	2%	2%	7%	3%
2	17th St/ Bryant St	3%	4%	3%	1%	2%	3%	2%	1%	1%	1%	1%	0%
3	Mariposa St/ Bryant St	3%	4%	3%	2%	1%	3%	1%	1%	2%	1%	2%	1%
4	Mariposa St/ York St	3%	--	4%	2%	1%		3%	1%	2%		1%	1%
5	17th St/ Hampshire St	0%	0%	4%	1%			2%		0%	0%	2%	1%
6	Mariposa St/ Hampshire St	4%	0%	3%	2%	1%		3%	1%	3%	0%	0%	1%
7	16th St/ Potrero Ave	4%	4%	9%	5%	2%	2%	2%	2%	2%	2%	7%	3%

* Based on PM Peak hour existing counts

Project Trips:	Daily
% Non-Bus HV	1%
% Bus	3%

Appendix F-4

Operational and Cumulative Traffic Noise Model Outputs

Overview: Traffic noise levels for the Potrero Yard Modernization Project were determined using the Federal Highway Administration Traffic Noise Model (TNM) Lookup tool, version 2.5.

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Mariposa Street East of Hampshire St E

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	266.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	8.0
Average heavy truck speed (mph):	30.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	58.6

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Mariposa Street East of Hampshire St E+P

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	369.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	11.0
Average heavy truck speed (mph):	30.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	60.0

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Mariposa Street East of Hampshire St C

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	469.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	15.0
Average heavy truck speed (mph):	30.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	61.2

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Mariposa Street East of Hampshire St C+P

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	572.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	18.0
Average heavy truck speed (mph):	30.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	62.0

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Hampshire Street north of 17th St E

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	23.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	45.6

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Hampshire Street north of 17th St C

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	50.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	49.0

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Hampshire Street north of 17th St C+P

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	50.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	49.0

APPENDIX G

Air Quality Calculation Details and Supporting Information

Appendix G-1: Air Quality and Health Risk Assessment Methodology

Appendix G-2: Construction Criteria Air Pollutant Calculations and Supporting Documentation

Appendix G-3: Operation Criteria Air Pollutant Calculations and Supporting Documentation

Appendix G-4: Air Dispersion Modeling and Health Risk Assessment Calculations and Supporting Documentation

Appendix G-5: Project Update to the Citywide Health Risk Assessment Database (electronically submitted to the San Francisco Environmental Planning Department)

Appendix G-6: Air Quality Modeling Uncertainties

Appendix G-1

Air Quality and Health Risk Assessment Methodology

AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

16 NOVEMBER 2020

POTRERO YARD MODERNIZATION PROJECT
San Francisco, California

For:
San Francisco Planning Department
San Francisco, California

18202-00.02710

BASELINE ENVIRONMENTAL CONSULTING
5900 Hollis Street, Suite D, Emeryville, CA 94608 | P: (510) 420-8686 | www.baseline-env.com

TRANSMITTAL

To: Peter Mye, SWCA

Date: 16 November 2020

Project No: 18202-00.02710

Subject: **Air Quality and Health Risk Assessment Methodology for Potrero Yard Modernization Project, San Francisco, California**

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AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

16 NOVEMBER 2020

POTRERO YARD MODERNIZATION PROJECT
San Francisco, California

FOR:
San Francisco Planning Department
San Francisco, California

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BASELINE ENVIRONMENTAL CONSULTING
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AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

Potrero Yard Modernization Project

1. INTRODUCTION

At the request of the San Francisco Municipal Transportation Agency (SFMTA) and as directed by the San Francisco Planning Department, Baseline Environmental Consulting (Baseline) will evaluate the potential local and regional air quality impacts associated with implementation of the proposed Potrero Yard Modernization Project (proposed project). Baseline has prepared this document to describe the approach for evaluating criteria air pollutant and toxic air contaminant (TAC) emissions, as well as potential local health effects related to proposed project emissions. This approach will be used to support environmental review of the proposed project under the California Environmental Quality Act (CEQA).

1.1 Project Description

The proposed project is an SFMTA capital project to rebuild and expand the Potrero Yard transit facility at 2500 Mariposa Street in San Francisco (Figure 1). The proposed project is a part of the SFMTA's 20-year Building Progress Program to expand and modernize its facilities to meet growing transportation demands and changing technologies. The project is proposed to accommodate bus maintenance, operation, and administrative uses within a modern, energy-efficient, and seismically-safe transit facility. The proposed program would incorporate modern bus technologies, facilitate the transition to a future all-electric battery-powered bus fleet, improve work conditions, increase the efficiency and timeliness of bus maintenance and repairs, and promote resiliency and flexibility in the face of climate change and natural disasters. The proposed project would also include a joint development program, with residential uses within and atop the transit facility podium and a ground floor commercial/active use along Bryant Street, and potentially other frontages.

Under the proposed project, the existing bus storage yard (including the bus wash area and running repair station) and the maintenance and operations building (including the second-floor parking deck) would be demolished and replaced with a new, approximately 75- to 150-foot-tall and approximately 1,300,000-gross-square-foot structure. Commercial and residential uses would be along the perimeter of the podium on six floors, and three to seven floors of residential development atop the transit facility podium. The proposed project would consist of the following project components:

- The transit facility, an approximately 75-foot tall podium with three transit levels. The proposed transit facility would include 52,000 square feet of administrative, training, and office space (e.g., offices, conference rooms, break rooms/kitchenettes, and training rooms). The remaining 671,000 square feet of space would include bus service,

storage, and circulation space. The facility would be designed to include parking for 213 buses, 18 maintenance bays and maintenance support areas, operations, an SFMTA operator training center, storage (parts and battery-electric infrastructure), administrative uses/common areas (e.g., offices, conference rooms, break rooms), and joint development uses. A total of 310 parking spaces would be provided: 63 spaces for the 40-foot-long buses, 150 spaces for the articulated 60-foot-long buses, and 97 parking spaces for large and standard non-revenue vehicles. The proposed transit facility would also include a basement to accommodate transit facility and joint development service functions.

- Residential apartments, including up to 575 residential units in three to seven levels developed atop the proposed transit facility.

- Commercial/retail uses, including up to approximately 33,000 square feet along the perimeter of the proposed replacement transit facility.

1.1.1 Construction

The SFMTA estimates that construction of the proposed project would occur in one phase and take three to four years to complete, with construction beginning in 2023 and building occupancy likely by the end of 2026. Demolition would last about 2 months and site preparation, grading, and piling would last about 5 months. Installation of the foundation system would last about 2 months. Above-ground building construction, exterior finishing, and interior finishing would take a total of about 27 months, with some work overlap. Construction-related activities would typically occur Monday through Saturday, between 7 a.m. and 8 p.m., with most work occurring between Monday and Friday. Nighttime construction is anticipated for certain activities such as major concrete pours; however, construction on Sundays and major legal holidays is not anticipated. Throughout the construction period, construction staging would occur on site and on the surrounding sidewalks.

1.1.2 Operations

The SFMTA estimates that operation of the proposed project would begin as early as 2026. The proposed transit facility would operate 24 hours per day, 7 days a week. The proposed transit facility would continue to use solvents for bus cleaning activities in accordance with the emission limitations described under the facility's existing Bay Area Air Quality Management District (BAAQMD) Permit to Operate (i.e., no net change in permissible solvent emissions are proposed or required).[1] There are no other existing sources of TAC emissions at the existing facility. The proposed transit facility would also include operation of two emergency diesel generators with a maximum power of about 1,000 kilowatts. Backup power for the proposed residential apartments would include one emergency diesel generator with a maximum power of about 1,000 kilowatts. The proposed project would not use natural gas and, therefore, would not include any natural-gas powered process boilers. Upon commencement of operations the

[1] Bay Area Air Quality Management District Permit to Operation, Plant #9427, San Francisco Municipal Railway Potrero.

SFMTA expects that the Potrero Yard facility would have an employment population of approximately 829 full-time equivalent persons, including 383 operators.

1.1.3 Project Variant

The proposed project includes three proposed variants:

- Variant 1: Internal relocation of ramps from the north portion of site to a more southerly location allowing for the activation of the 17th Street frontage.

- Variant 2: Relocation of proposed emergency exit from 17th Street west of Hampshire Street to Hampshire Street south of 17th Street, or other measures to address potential conflicts with the bicycle track.

- Variant 3: Relocation of joint development lobby away from Mariposa Street to Hampshire Street.

Each of the variants modify one limited feature or aspect of the proposed project and do not alter the development program. Therefore, air pollutant emissions and associated health risks from the construction and operation of the proposed variants are anticipated to be the same as the proposed project.

1.2 Overview of Assessment Approach

In accordance with the BAAQMD's 2017 CEQA guidelines, the air quality and health risk assessment will support the evaluation of potential local and regional air quality impacts associated with construction and operation of the proposed project.[2] When feasible, assumptions and methods from the San Francisco Citywide Health Risk Assessment (Citywide HRA), which was developed in consultation with the BAAQMD, will be included in the assessment.[3] The air quality and health risk assessment for the proposed project will evaluate:

- Mass emissions of criteria air pollutants from both construction and operational sources;
- Excess lifetime cancer risks and $PM_{2.5}$ concentrations at sensitive receptors during construction and operation in addition to existing cancer risk and $PM_{2.5}$ concentrations at sensitive receptor locations;
- Chronic hazard indices (HIs) at sensitive receptors during construction and operation;
- Cumulative health risks including emissions from existing sources, the proposed project, and reasonably foreseeable future projects; and

[2] Bay Area Air Quality Management District (BAAQMD), 2017, California Environmental Quality Act Air Quality Guidelines, May.

[3] San Francisco Department of Public Health, 2020, Draft San Francisco Citywide Health Risk Assessment: Technical Support Documentation, February.

- Quantitative analysis of available control measures that would reduce the proposed project's criteria pollutant emissions and the project's contribution to health risks.

2. EMISSION ESTIMATION METHODS

The proposed project would generate criteria air pollutant and TAC emissions during construction and operation. The primary pollutant emissions of concern would be ozone precursors (i.e., reactive organic gases [ROGs] and nitrogen oxides [NOx]), respirable particulate matter less than 10 microns in diameter (PM_{10}), fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), total organic gases (TOG), and diesel particulate matter (DPM). All DPM emissions will be conservatively assumed to be equal to PM_{10} emissions from diesel exhaust, because more than 90 percent of DPM is less than 1 micron in diameter.

2.1 Calculation Methodologies for Construction Emissions

During construction, the primary emission sources of concern would include emissions from off-road construction equipment and on-road vehicles (worker vehicles, vendor trucks, concrete trucks, and haul trucks), and off-gassing from architectural coatings and asphalt paving. Emissions will be estimated based on project-specific construction information provided by the SFMTA. A preliminary draft of the SFMTA's project-specific construction information is provided in Appendix A.

2.1.1 Off-Road Construction Equipment

Construction of the proposed project would rely on electrical-, propane-, and diesel-powered off-road equipment. Emissions from off-road construction equipment will be estimated using the methodology described below and based on the SFMTA's summary of equipment use anticipated for each of the following phases of project construction (Appendix A): demolition; site preparation, grading, and pile-driving; foundation; building construction; paving; and architectural coating.

While the use of electrical power supply during construction may come from fossil fuel power plants that generate criteria air pollutants, these pollutant emissions would be associated with the individual power plant operations (which may not occur in the San Francisco air basin or even in the state) and not the proposed project. Power plants are existing stationary sources subject to air district and/or the United States Environmental Protection Agency's (U.S. EPA's) permitting requirements to monitor and control pollutant emissions. Therefore, pollutant emissions associated with the use of off-site generated electrical power during construction of the proposed project will not be estimated.

Use of diesel construction equipment would occur during each phase of construction. Propane construction equipment would also be used for several types of equipment (e.g., forklifts), which generates lower pollutant emissions than diesel; however, to simplify calculations and be conservative, all propane emissions will be estimated as diesel emissions. The proposed project is mapped in the San Francisco Department of Public Health's Air Pollutant Exposure Zone (APEZ), which is an area designated as having poor air quality from existing freeway, maritime,

and industrial activities.[4] To reduce diesel exhaust emissions within an APEZ, the San Francisco Clean Construction Ordinance requires all off-road diesel equipment to be equipped with Tier 2 or higher engines and the most effective Verified Diesel Emission Control Strategies available for the engine type.[5] It should be noted that off-road propane equipment is not subject to the Clean Construction Ordinance. Consistent with the Clean Construction Ordinance, uncontrolled construction emissions will be estimated assuming that all off-road diesel equipment would be equipped with engines certified to meet the U.S. EPA's Tier 2 emission standards and Level 3 diesel particulate filters. Consistent with CalEEMod 2016.3.2, the diesel particulate filters were assumed to reduce exhaust particulate matter and reactive organic gases emissions by 85 and 90 percent, respectively.

Emissions from off-road diesel equipment will be estimated in accordance with methodologies presented in the California Air Resources Board's (CARB's) *Off-road Simulation Model and Summary of Off-Road Emissions Inventory Update*[6] and using data derived from the CARB's Off-Road Emissions Inventory Model (OFFROAD2011) and California Emissions Estimator Model version 2016.3.2 (CalEEMod 2016.3.2). The equation used to estimate emissions of ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ from off-road diesel equipment is presented in Table 1. Construction of the proposed project is expected to begin in 2023 and end in 2026, with construction activities predominantly occurring Monday through Friday. The total estimated pollutant emissions will be converted to average daily emission rates using the total number of work days over the construction period (approximately 780 work days).

2.1.2 On-Road Construction Vehicles

Construction of the proposed project would generate emissions from on-road vehicle trips for worker commute, vendor trucks, haul trucks, and concrete trucks. Emissions from on-road construction vehicles will be estimated using the methodology described below and based on the SFMTA's summary of anticipated construction vehicle trips for each phase of construction (Appendix A). In general, workers would commute to the proposed project staging areas, surrounding neighborhoods, or nearby parking garages. Vendor, haul, and concrete truck trips would travel to and from the proposed project staging areas.

Emission factors for running and idling exhaust emissions will be derived from CARB's *EMission FACtors Model* (EMFAC2017), which accounts for the CARB's on-road diesel fleet rules, Pavley Clean Car Standards, and the Low Carbon Fuel Standard. The emissions factors for the earliest date of construction (2023) will be used for each vehicle type based on EMFAC2017's aggregate speed and model year options. All worker vehicles will be assumed to be gasoline powered and all trucks will be assumed to be diesel powered.

[4] San Francisco Planning Department, 2020, Property Information Map - Map Viewer; Air Pollution Exposure Zone (2020). Available at: https://sfplanninggis.org/pim/. Accessed on June 15, 2020.

[5] San Francisco Department of the Environment, San Francisco Department of Public Health, San Francisco Planning Department, 2015, San Francisco Clean Construction Ordinance, Implementation Guide for San Francisco Public Projects, August.

[6] California Air Resources Board (CARB), 2010, Off-road Simulation Model and Summary of Off-Road Emissions Inventory Update.

For worker vehicle, vendor truck, concrete truck, and haul truck trips, the vehicle fleet mix will be based on the default parameters from CalEEMod. For soil disposal trips, it was conservatively assumed that all soils would be transported to the Altamont Landfill in Livermore, which is near the border of the San Francisco Bay Area Air Basin. For trips with unknown destinations, such as worker vehicle, concrete truck, and miscellaneous vendor truck trips, the travel distance for each trip will be based on default parameters from CalEEMod to calculate total vehicles miles travelled. A preliminary draft of the fleet mix and trip lengths for each destination type are summarized in Appendix A. The equations used to estimate emissions of ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ from on-road vehicles are presented in Table 1.

2.1.3 Off-Gassing from Architectural Coating and Asphalt Paving

ROG off-gassing from architectural coatings will be calculated based on the square footage of the proposed project buildings, an assumed volatile organic compound (VOC) content of the paint, and an application rate. The VOC content of the paint is assumed to be consistent with the limits set in BAAQMD Regulations 8, Rule 3.[7] Similarly, ROG off-gassing from paving will be calculated based on the paved area of the proposed project and the VOC emission factor per acre of parking area. The equations and parameters used for calculating ROG off-gassing from architectural coatings and pavement are summarized in Table 1.

2.2 Calculation Methodologies for Operational Emissions

Operation of the proposed project could commence as early as 2026. The primary sources of pollutant emissions during project operation would include vehicle trips, energy use, stationary equipment, and area sources such as the use of consumer products and architectural coatings. The net increase in pollutant emissions for the proposed project relative to the existing transit facility operations will be estimated, as described below.

The net increase in emissions from energy use and area sources will be calculated using CalEEMod 2016.3.2. The selected land-use (e.g., mid-rise apartment) and input parameters (e.g., square footage) for the model will be consistent with the final project description and parameters used for the final travel demand analysis prepared for the proposed project.

The net increase in emissions from stationary sources will also be calculated using CalEEMod 2016.3.2. The proposed transit facility would continue to use solvents for bus cleaning activities in accordance with the emission limitations described under the facility's existing BAAQMD Permit to Operate (i.e., no net change in permissible solvent emissions).[8] In addition, the proposed project includes up to three new diesel backup generators with a maximum power of 1,000 kilowatts.

[7] BAAQMD, 2001, Regulation 8, Organic Compounds, Rule 3, Architectural Coatings, November 21.

[8] Bay Area Air Quality Management District Permit to Operation, Plant #9427, San Francisco Municipal Railway Potrero.

The California Air Toxics Control Measure for Stationary Compression Ignition Engines and BAAQMD Rule regulation 9, rule 8, restrict non-emergency use of emergency standby diesel-fueled compression ignition engines to a maximum of 50 hours per year;[9] therefore, it was assumed that each emergency generator would operate 50 hours per year for testing and maintenance purposes. The generators would be permitted with the BAAQMD and would comply with applicable Best Available Control Technology and Best Available Control Technology for Toxics requirements.

CalEEMod has not been updated to incorporate the latest vehicle emission factors from EMFAC2017. Therefore, emissions from vehicle trips will be estimated using CalEEMod methodology and incorporating emission factors from EMFAC2017, as described below.

2.2.1 On-Road Operation Vehicles

Operation of the proposed project would generate a net increase in emissions from on-road vehicles associated with worker, residential, and retail trips. The proposed project would not generate a net increase in emissions from new bus trips, because all of the existing and new buses would be electric-powered. The net increase in emissions from on-road vehicles during operation of the proposed project will be estimated using the methodology described below and based on vehicle trip information provided by the traffic engineer, including vehicle miles traveled, daily trips rates, and fleet mix.

Emission factors for running, idling, brake wear, and tire wear emissions will be derived from EMFAC2017, which accounts for the CARB's on-road diesel fleet rules, Pavley Clean Car Standards, and the Low Carbon Fuel Standard. The emissions factors for the earliest date of operation (2026) will be used for each vehicle type based on EMFAC2017's aggregate speed and model year options. In accordance with the Citywide HRA, fugitive $PM_{2.5}$ emissions will the estimated assuming that 91 percent of $PM_{2.5}$ emissions from exhaust, brake wear, and tire wear is resuspended as fugitive dust.[10] Based on CARB's Entrained Road Travel methodology for paved road dust, fugitive PM_{10} emissions will be estimated assuming that fugitive $PM_{2.5}$ emissions are approximately 15 percent of the fugitive PM_{10} emissions.[11] The equations used to estimate emissions of ROG, NOx, PM_{10}, $PM_{2.5}$, and TOG from on-road vehicles are presented in Table 1.

2.3 Air Concentrations Estimation Methods

The health risk assessment will evaluate the health impacts associated with excess lifetime cancer risks, exposure to $PM_{2.5}$ concentrations, and chronic HIs at nearby sensitive receptors from the proposed project. Annual average concentrations of TACs will be estimated through air dispersion modeling of emissions from off-road diesel construction equipment proposed at

[9] Bay Area Air Quality Management (BAAQMD), 2018, Regulation 9, Rule 8, Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines, Last updated: April.

[10] San Francisco Department of Public Health, 2020, Draft San Francisco Citywide Health Risk Assessment: Technical Support Documentation, February.

[11] California Air Resources Board, 2016, Miscellaneous Process Methodology. Entrained Road Travel, Paved Road Dust. Available at: https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf

the project site; on-road construction diesel trucks accessing the roadways adjacent to the proposed project; on-road operational vehicles near the project site; and emergency generator operations at the proposed project site. The concentrations will then be used to estimate the health risk impacts from project construction and operation. The methodologies used to evaluate emissions from construction and operation of the proposed project will be consistent with the Citywide HRA and the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards.*[12]

2.4 Chemical Selection

The excess lifetime cancer risks analysis will be calculated based on concentrations of DPM and/or TOG from off-road construction equipment, on-road construction trucks, on-road operational vehicles, and emergency diesel generators during operation. Diesel exhaust, a complex mixture that includes hundreds of individual constituents, is identified by the State of California as a known carcinogen.[13] Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. The California Environmental Protection Agency (Cal/EPA) and other proponents of using the surrogate approach to quantifying excess lifetime cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach because it provides a protective approach to estimating health risks. A component-based approach involves estimating risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel as a whole mixture because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will exceed the multi-pathway cancer risk from the speciated components."[14] These analyses will be based on the surrogate approach, as recommended by Cal/EPA.

Because a surrogate approach has not been recommended for effects from gasoline-fueled vehicles, the component-based approach will be used to estimate effects from gasoline-fueled on-road operational vehicles. The speciation profile for gasoline was obtained from the BAAQMD's *Recommended Method for Screening and Modeling Local Risk and Hazards*.[15]

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[12] Bay Area Air Quality Management District (BAAQMD), 2011, Recommended Methods for Screening and Modeling Local Risks and Hazards, May.

[13] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, 1998, Findings of the Scientific Review Panel on the Report on Diesel Exhaust, as adopted at the Panel's April 22, 1998, meeting.

California Environmental Protection Agency, 2016. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values, March. Available at: https://www.arb.ca.gov/toxics/healthval/contable.pdf

[14] Office of Environmental Health Hazard Assessment, 2003, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August. Available at: https://oehha.ca.gov/media/downloads/crnr/hrafinalnoapp.pdf

[15] Bay Area Air Quality Management District (BAAQMD), 2011, Recommended Methods for Screening and Modeling Local Risks and Hazards, May.

2.5 Model Selection and Parameters

Consistent with the Citywide HRA, near-field air dispersion modeling of DPM and $PM_{2.5}$ from project construction and operation will be conducted using the USEPA's atmospheric dispersion modeling system (AERMOD). For each receptor location, the model will generate average air concentrations (or air dispersion factors as unit emissions) that result from emissions from multiple sources.

Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological parameters, topography information, and receptor parameters. When site-specific information is unknown, the same assumptions used in the Citywide HRA will be used, when available, or the default parameter sets that are designed to produce conservative (i.e., overestimates of) air concentrations will be selected.

2.5.1 Emission Sources

Emissions from off-road diesel construction equipment will be modeled as a series of area sources encompassing the proposed project site (Figure 1). Consistent with modeling assumptions used in the Citywide HRA, a release height of 5 meters and an initial vertical dimension of 1.4 meters will be used for each area source.

Emissions from on-road construction trucks and on-road operational vehicles will be modeled as a series of volume sources along the roadways adjacent to the project site. To be conservative, it will be assumed that each construction truck trip will include travel around the entire perimeter of the proposed project site. For operational vehicle trips, the project's daily net increase in traffic volumes for light-duty vehicles, trucks, and buses estimated on roadways near the maximally exposed individual resident (MEIR) will be used. Consistent with modeling assumptions used in the Citywide HRA, a release height of 2 meters, an initial vertical dimension of 2.3 meters, and an initial lateral dimension equal to the roadway width divided by 2.15 will be used for each volume source.

Emissions from the three emergency diesel generators during operation of the proposed project will be modeled as separate point sources. Because the exact location of the generators is not yet known, it will be assumed that the generators are located at ground level on the proposed project site near the MEIR. Consistent with the modeling assumptions used in the Citywide HRA, a stack height of 3.66 meters, diameter of 0.183 meters, temperature of 739.8 degrees Kelvin, and velocity of 45.3 meters per second will be used for each point source.

2.5.2 Emission Rates

Construction emission rates for off-road equipment and on-road vehicle sources will be calculated based on the actual hours of activities over the shortest duration of expected construction (3 years). For modeling purposes, it is assumed that construction activities would occur Monday through Friday, between 7 a.m. and 8 p.m.

Operation emission rates for on-road vehicles and emergency generator sources will be modeled as a continuous source (i.e., emissions occur 7 days a week, 24 hours per day, 365 days per year). This is consistent with the Citywide HRA methodology.

Dispersion of air pollutants from off-road construction equipment, on-road vehicles, and the emergency generators will be modeled using the χ/Q ("chi over q") method, such that each source has a unit emission rate (e.g., 1 gram per second for volume sources). The annual average concentration profiles from the air dispersion model will then be scaled according to the ratio between the unit emission rate and the actual emission rate from each source.

2.5.3 Meteorology

Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. Consistent with the Citywide HRA methodology, BAAQMD's Mission Bay meteorological data from 2008 will be used for this analysis.

2.5.4 Terrain considerations

Elevation and land use data will be imported from the National Elevation Dataset maintained by the United States Geological Survey. Dispersion coefficients for urban area will be selected for the proposed project location.

2.5.5 Receptors

In order to evaluate health impacts to off-site receptors, receptors will be modeled at locations co-located with the receptors used in the Citywide HRA and within 1,000 feet of the proposed project. Receptors will be modeled at a height of 1.8 meters above terrain height (i.e., the default breathing height for ground-floor receptors) which is consistent with the Citywide HRA methodology. Sensitive receptors (e.g., residents) will be identified based on review of publicly available aerial- and street-view maps. All off-site sensitive receptors, such as residential developments, schools or hospitals, will conservatively be treated as residential receptors in this analysis because residential receptors have the longest exposure duration, the highest breathing rate by applicable age group, and the highest exposure frequency and exposure time. The location of the MEIR will be identified using the concentration contours generated from the air dispersion model.

3. PROJECT-LEVEL HEALTH RISK ANALYSIS

In February 2015, the Office of Environmental Health Hazard Assessment (OEHHA) released the updated *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, which combines information from previously-released and adopted technical support documents to delineate OEHHA's revised risk assessment methodologies based on

current science.[16] This updated guidance manual supersedes OEHHA's 2003 guidance manual that previously provided methodologies for conducting health risk assessments under the Air Toxics Hot Spots Program (AB 2588). In September 2016, the BAAQMD adopted the OEHHA 2015 guidance manual for all health risk assessments other than gasoline dispensing facilities.[17] The OEHHA 2015 guidance manual and BAAQMD 2017 CEQA guidelines are used in this analysis to evaluate potential health risks to nearby sensitive receptors.[18]

3.1 Areas and Sources Evaluated

As discussed in Section 3, the receptor grid from the Citywide HRA will be used to model air pollutant concentrations at all receptors within 1,000 feet of the construction site. Excess lifetime cancer risks, $PM_{2.5}$ concentrations, and chronic non-cancer HIs from the project will be evaluated at sensitive receptors. The following sources could potentially contribute to health risks at the sensitive receptors:

- Off-road diesel-powered equipment during construction;
- On-road diesel-powered trucks during construction;
- On-road gasoline-powered light-duty vehicles, diesel-powered trucks, and electric-powered buses during operation; and
- Emergency diesel generators during operation.

The net increase in electric-powered buses during project operation would not generate TACs from engine exhaust, but would contribute to the resuspension of fugitive $PM_{2.5}$ dust. The on-road construction trucks and other operational vehicles would also contribute to the resuspension of fugitive $PM_{2.5}$ dust.

3.2 Exposure Assessment

3.2.1 Potentially Exposed Population

The analysis will evaluate the following receptor populations based on OEHHA 2015 guidelines for two scenarios, which are expected to have the highest impacts from the proposed project:

- **Scenario 1:** 30-year off-site residential exposure commencing[19] at the start of proposed project construction and continuing through project operation;

[16] Office of Environmental Health Hazard Assessment (OEHHA), 2015, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment, August.

[17] Bay Area Air Quality Management District, 2016, Air Toxics NSR Program, Health Risk Assessment Guidelines, December.

[18] Note: the health risks associated with naturally occurring asbestos are analyzed in the Hazardous Materials section of the Environmental Impact Report. Therefore, naturally occurring asbestos analysis will not be included as a part of the air quality technical report.

[19] The 30-year exposure is assumed to begin in the last trimester of pregnancy.

- **Scenario 2:** 30-year off-site residential exposure commencing at the time of project operation.

Under Scenario 1, residential risks from construction emissions will be added to residential risks associated with operational emissions from a combined total of 30 years of exposure, to ensure that the full impact of project construction and operation on nearby receptors is evaluated. Scenario 2 evaluates the impact on sensitive receptors from 30 years of exposure to operational emissions only (not construction of the proposed project). The 30-year exposure duration scenarios are consistent with OEHHA's guidance[20] for evaluating cancer risk at the MEIR.

3.2.2 Exposure Assumptions

The exposure parameters used to estimate excess lifetime cancer risks for all potentially exposed populations for the construction/operation combined scenario (Scenario 1) and operation-only scenario (Scenario 2) for this analysis will be obtained using risk assessment guidelines from OEHHA and BAAQMD, unless otherwise noted, and are presented in Table 2.

3.2.3 Calculation of Intake

The dose estimated for each exposure pathway is a function of concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR \times FAH \times EF \times ED \times CF}{AT}$$

Where:
IF_{inh} = Intake Factor for Inhalation (m^3/kg-day)
DBR = Daily Breathing Rate (L/kg-day)
FAH = Frequency of time at home (unitless)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
AT = Averaging Time (days)
CF = Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the current OEHHA guidance.[21]

3.3 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For

[20] Office of Environmental Health Hazard Assessment (OEHHA), 2015, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment, August.

[21] Office of Environmental Health Hazard Assessment, 2015, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment, August.

purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer endpoints. Toxicity values that are used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

Following the Citywide HRA methodology for cancer risk calculations, the carcinogenic toxicity for DPM from off-road construction equipment, on-road construction trucks, on-road operational trucks, and emergency diesel generators, as well as TOG from gasoline-powered light-duty vehicles during operation, will be considered for cancer risk calculations. Chronic hazard quotients (HQs) calculated for project construction and operation will utilize toxicity values for chemicals emitted from these same sources. This analysis will use the Cal/EPA's approved inhalation Cancer Potency Factors (CPFs) and chronic inhalation reference exposure levels (RELs) for DPM and TOG.[22] Toxicity values are summarized in Table 3.

3.4 Age Sensitivity Factors

The estimated excess lifetime cancer risks for a resident child will be adjusted using age sensitivity factors (ASFs) that account for an "anticipated special sensitivity to carcinogens" of infants and children as recommended in the OEHHA Technical Support Document[23] and OEHHA 2015 Hot Spots guidance.[24] Cancer risk estimates will be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor will be applied to age 16 and older. This approach was also adopted by BAAQMD in its most recent Air Toxics NSR Program HRA Guideline.[25]

As presented in Table 2, analyses conducted under the OEHHA 2015 guidance incorporate age groupings that align with the age breakouts discussed for the application of ASFs; therefore, the ASFs can be applied directly to each age grouping. The ASFs used to evaluate off-site residents for each scenario evaluated under the 2015 OEHHA methodology are summarized in Table 4.

3.5 Risk Characterization

3.5.1 Estimation of Cancer Risks

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed

[22] California Environmental Protection Agency, 2016, OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values, March.

[23] California Environmental Protection Agency, 2009, Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustment to Allow for Early Life Stage Exposures, May.

[24] Office of Environmental Health Hazard Assessment, 2015, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment, August.

[25] Bay Area Air Quality Management District, 2016, Health Risk Assessment Guidelines, Air Toxics NSR Program, December.

to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific CPF.

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_{inh} = C_i \times CF \times IF_{inh} \times CPF_i \times ASF$$

Where:
$Risk_{inh}$ = Cancer Risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)
C_i = Annual Average Air Concentration for Chemical *i* (µg/m^3)
CF = Conversion Factor (mg/µg)
IF_{inh} = Intake Factor for Inhalation (m^3/kg-day)
CPFi = Cancer Potency Factor for Chemical *i* (mg chemical/kg body weight-day)$^{-1}$
ASF = Age Sensitivity Factor (unitless)

3.5.2 Estimation of Chronic Non-Cancer Hazard Indices

The potential for exposure to result in adverse chronic non-cancer effects is evaluated by comparing the estimated annual average air concentration (which is equivalent to the average daily air concentration) to the non-cancer chronic REL for each chemical. When calculated for a single chemical, the comparison yields a ratio termed an HQ. To evaluate the potential for adverse chronic non-cancer health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding an HI.

$$HQ_i = {}^{C_i}/_{REL_i}$$

$$HI = \sum_i HQ_i$$

Where:
HQ_i = Chronic hazard quotient for chemical *i*
HI = Chronic hazard index
C*i* = Annual average concentration of chemical *i* (µg/m^3)
REL_i = Chronic non-cancer reference exposure level for chemical *i* (µg/m^3)

3.6 Project Contribution to Existing Health Risks (from Citywide HRA)

The Citywide HRA evaluated cancer risks and $PM_{2.5}$ concentrations from existing known sources of air pollution, including stationary sources such as emergency generators and gasoline stations, and major roadways such as U.S. Highway 101 located in the vicinity of the project. The Citywide HRA was used to identify the APEZ. The Citywide HRA was developed in 2012 and most recently updated in 2020 to include more recent data and updated guidance from OEHHA for conducting health risk assessments under the Air Toxics Hot Spots Program. The project-level cancer risks and $PM_{2.5}$ concentrations will be added as an overlay to the Citywide HRA. The

combined health risk database will be used to determine whether the proposed project would substantially contribute to existing health risks.

4. CUMULATIVE HEALTH RISK ASSESSMENT

According to the BAAQMD CEQA Guidelines, impacts from off-site sources within the "zone of influence" of the off-site MEIR should be evaluated. As discussed in Section 4.6, the proposed project contribution to the existing Citywide HRA database will be evaluated. However, new sources of TACs not included in the Citywide HRA will need to be calculated and added to the cumulative health risk assessment.

4.1 Existing Sources from Citywide HRA

As discussed in Section 4.6, the existing sources of TACs in the vicinity of the project have been included in the Citywide HRA, which will be added to cumulative health risks.

4.2 New Sources from Cumulative Projects

After the MEIR is identified upon completion of the project-level health risk analysis, new and foreseeable future projects will be identified within 1,000 feet of the MEIR. These cumulative projects may include new sources of TACs, such as vehicle trips and emergency diesel generators. The Environmental Planning Division of the San Francisco Planning Department will provide available information for each project within 1,000 feet of the project MEIR, such as the project description, emissions sources, and health risks to nearby sensitive receptors. If the HRA results from a cumulative project are available, they will be added to the existing HRA results from the Citywide HRA at the MEIR location. If the HRA results are not available for a cumulative project, the potential impacts will be discussed qualitatively and, if needed, conservative health risks will be assigned based on coordination with Environmental Planning Division of the San Francisco Planning Department.

4.3 Cumulative Risk Calculation

For simplicity, it is assumed that construction and operational emission rates and associated health risks are constant for every day of the year for each cumulative project. The cumulative health risk database developed for the proposed project will be submitted to the Environmental Planning Division for documentation purposes.

4.4 Modeling Uncertainties

A summary of the modeling uncertainties will be included as an appendix to the air quality analysis. This will include a semi-quantitative analysis of how the U.S. EPA's recent Safer Affordable Fuel-Efficient Vehicles Rule Part 1: One National Program would affect the EMFAC2017 emission factors for light-duty gasoline-powered vehicles. Additional uncertainties regarding modeling assumptions, parameters and other factors will also be provided.

5. CONTROL MEASURES

If the proposed project's air quality impacts exceed the applicable CEQA thresholds under the uncontrolled scenario, the adequacy of the analysis will be discussed and refined modeling assumptions may be considered. Modeling refinements may include accounting for the project's proposed use of propane-powered off-road equipment during construction or refining the construction truck trip distances. Alternatively, one or more of the following control measures may be selected to reduce the impacts:

- Use of all Tier 4 Final engines for off-road construction equipment.
- Use of Tier 4 Final engines for off-road construction equipment with engines beyond a certain horsepower (e.g., engines equal to or greater than 175 horsepower).
- Use of additional alternative fuels (e.g., propane, electricity, renewable diesel) for diesel off-road construction equipment.
- Use of post-2010 or newer model year haul trucks.

6. DELIVERABLES AND COORDINATION

Baseline will not prepare a stand-alone air quality and health risk assessment technical study. Instead, Baseline will work with SWCA Environmental Consultants to document the results of the assessment in the draft EIR for the proposed project, with technical documentation included as part of the EIR appendix. The air quality technical appendix will provide details that are not required within the EIR section, such as detailed descriptions of air-pollutant emission and health risk assessment methodologies and parameters.

Upon completion and approval of the Air Quality Technical Report Methodology, Baseline will submit the following deliverables:

- Preliminary results of criteria air pollutant emissions, project-level HRA, existing plus project, and cumulative (existing plus project plus cumulative projects) HRA in tabulated format.
- A Draft Air Quality section for the EIR with the following supporting technical information in an appendix:
    - The final air quality and HRA methodology, detailed summary tables of modeling assumptions and results, a map of sensitive receptors and sources used for air dispersion modeling, a summary of any deviations from the methodology, and a discussion of modeling uncertainties.
- Updated Citywide HRA database that includes the project's impacts to receptors within 1,000 feet of the project site.

Following approval of this methodology, Baseline anticipates the following coordination efforts with the Environmental Planning Division and the SFMTA:

- One meeting to discuss cumulative projects and how to incorporate these projects into the cumulative HRA
- One meeting to discuss the preliminary results for the air quality analysis, which may include the following items:
    - Model adjustments
    - Control measures and their effectiveness
- One meeting to discuss the Environmental Planning Division's feedback on the Draft Air Quality section for the EIR.

FIGURE

Project Location

Figure 1

Legend

Proposed Project Site (Approximate)

Base: Google Aerial Map, 2020.

0 200 Feet N

Potrero Yard Modernization Project
San Francisco

BASELINE ENVIRONMENTAL CONSULTING

TABLES

Table 1
Emissions Calculation Methodology
Potrero Yard Modernization Project
San Francisco, California

Type	Project Phase	Source	Formula	Formula Reference
Off-Road Equipment[1]	Construction	Diesel Exhaust	$E_D = \sum(EF_D * HP * LF * Hr * Red * C)$	CARB 2010
On-Road Vehicles[2]	Construction and Operation	Exhaust – Running	$E_R = \sum(EF_R * VMT * C)$	CARB 2018
		Exhaust – Idling	$E_I = \sum(EF_I * Idle\ hours * C)$	CARB 2018
		Brake Wear (Operation Only)	$E_{BW} = \sum(EF_{BW} * VMT * C)$	CARB 2018
		Tire Wear (Operation Only)	$E_{TW} = \sum(EF_{TW} * VMT * C)$	CARB 2018
		Dust Resuspension (Operation only)	$EF_{FP} = 0.91 * (E_R + E_{BW} + E_{TW})$ $EF_{RP} = EF_{FP} / 0.15$	SFDPH 2020 CARB 216
Architectural Coatings[3]	Construction	Off-Gassing	$E_{AC} = \sum(EF_{AC} * A_{paint} * F_{area})$	CAPCOA 2016
Asphalt Paving[4]	Construction	Off-Gassing	$E_{AP} = \sum(EF_{AP} * A_{parking})$	CAPCOA 2016
Stationary Sources[5]	Operation	Emergency Generator	$E_G = \sum(EF_G * HP * LF * Hr * C)$	CAPCOA 2016

Notes:
lb = pound; g = gram; hp = horsepower; hr = hour; SF = square feet
Reactive organic gases and volatile organic compounds can be used interchangeably for CEQA analysis.
The emission calculation methodology for the proposed project's operational emissions estimated using CalEEMod 2016.3.2 are summarized in the CalEEMod User's Guide (CAPCOA 2016).

[1] Parameters used for estimating off-road construction equipment emissions:
E_D = off-road diesel equipment exhaust emissions (lb).
EF_D = diesel equipment emission factor (g/hp-hr). CalEEMod 2016.3.2 default values used.
HP = equipment horsepower. OFFROAD2011 default values used.
LF = equipment load factor. OFFROAD2011 default values used.
Hr = total hours of equipment operation.
Red = reduction from diesel particulate filter.
C = unit conversion factor (1 lb/454 g).

[2] Parameters used for estimating on-road vehicle emissions:
E_R = on-road vehicle running exhaust emissions (lb).
EF_R = running emission factor (g/mile). EMFAC2017 values for aggregate speed and model years used.
VMT = vehicle miles travelled.
E_I = on-road vehicle idling exhaust emissions (lb). Idling exhaust is calculated only for heavy-duty trucks.
EF_I = idling emission factor (g/hour). EMFAC2017 values used.
EF_{BW} = brake wear emission factor (g/mile). EMFAC2017 values used.
EF_{TW} = tire wear emission factor (g/mile). EMFAC2017 values used.
Idle hours = total ours of truck idling. Assumes average idling time per trip.
C = unit conversion factor (1 lb/454 g).
EF_{FP} = fugitive dust emissions factor for fine particulates (g/mile).
EF_{RP} = fugitive dust emission factor for respirable particulates (g/mile).

[3] Parameters used for estimating architectural coating emissions:
E_{AC} = architectural coating emissions (lb).
EF_{AC} = off-gassing emission factor (lb/SF). Based on the volatile organic compound content of paint and application rates. Consistent with Bay Area Air Quality Management District's Regulation 8, Rule 3, assumed 100 grams per liter for indoor paint and 150 grams per liter for exterior paint. Consistent with CAPCOA 2016, assumed 1 gallon of paint application per 180 square feet per.

A_{paint} = painted surface area (SF). Consistent with CAPCOA 2016, assumed the total surface for painting equals 270 percent of the floor square footage for residential buildings, 200 percent of the floor square footage for nonresidential buildings, and 6 percent of the square footage for parking lots.
F_{Area} = fraction of total painted surface area painted. Consistent with CAPCOA 2016, assumed 75 percent for the interior building surfaces, 25 percent for the exterior building surfaces, and 100 percent for parking lots.

[4] Parameters used for estimating asphalt paving emissions:
E_{AP} = asphalt paving emissions (lb).
EF_{AP} = off-gassing emission factor (lb/acre). Consistent with CAPCOA 2016, assumed 2.62 lb/acre.
$A_{parking}$ = parking lot area (acre).

[5] Parameters used for estimating emergency generator emissions:
E_G = emergency generator annual exhaust emissions (lb).
EF_G = diesel generator emission factor (g/hp-hr). Consistent with CAPCOA 2016 default values.
HP = generator horsepower.
LF = equipment load factor. Consistent with CAPCOA 2016 default values.
Hr = total hours of equipment operation. Assumes 50 hours of testing and maintenance per year per generator.
C = unit conversion factor (1 lb/454 g).

References:

California Air Resources Board (CARB), 2016, Miscellaneous Process Methodology. Entrained Road Travel, Paved Road Dust. Available at: https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf
California Air Resources Board (CARB), 2010, Off-road Simulation Model and Summary of Off-Road Emissions Inventory Update.
California Air Resources Board (CARB), 2018, EMFAC2017 Volume III – Technical Documentation, July 20.
California Air Pollution Control Officers Association (CAPCOA), 2016, CalEEMod User's Guide, Appendix A, Calculation Details for CalEEMod, October.
San Francisco Department of Public Health (SFDPH), 2020, Draft San Francisco Citywide Health Risk Assessment: Technical Support Documentation, February.

Table 2
Exposure Parameters for the Health Risk Assessment
Potrero Yard Modernization Project
San Francisco, California

Exposure Scenario	Phase	Receptor Age Group	Exposure Parameters					
			Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED)[2] [years]	Faction of Time at Home (FAH)[3] [unitless]	Exposure Frequency (EF)[4] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Scenario 1	Construction (3 Years)	3rd Trimester	361	0.25	0.85	350	25550	0.0011
		0-2 Years	1090	2	0.85			0.0254
		2-16 Years	572	1	0.72			0.0056
	Operation (27 years)	2-16 Years	572	13	0.72			0.0733
		16-30 Years	261	14	0.73			0.0365
Scenario 2	Operation (30 years)	3rd Trimester	361	0.25	0.85	350	25550	0.0011
		0-2 Years	1090	2	0.85			0.0254
		2-16 Years	572	14	0.72			0.0790
		16-30 Years	261	14	0.73			0.0365

Notes:

The location of the maximally exposed individual resident (MEIR) will be determined upon completion of the air dispersion model. Two exposure scenarios at the MEIR will be evaluated:

1) Scenario 1: 30-year residential exposure commencing at the start of proposed project construction and continuing through project operation;
2) Scenario 2: 30-year residential exposure commencing at the time of project operation.

[1] Based on 95th percentile daily breathing rates for age groups less than 2 years old and 80th percentile daily breathing rates for age groups that are greater than or equal to 2 years old from OEHHA 2015.

[2] The exposure duration reflects the default exposure scenario for a 30-year resident from OEHHA 2015.

[3] Based on recommended fractions of time spent at home for all age groups reported in OEHHA 2015.

[4] Exposure frequency reflects default exposure frequency from OEHHA 2015.

Calculation:

$IF_{inh} = DBR \times FAH \times EF \times ED \times CF / AT$

Where CF = 0.001 (m^3/L)

Abbreviations:

OEHHA = Office of Environmental Health Hazard Assessment
kg = kilogram
L = liter
m^3 = cubic meter

Reference:

OEHHA, 2015, Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessment, February.

Table 3
Toxicity Values
Potrero Yard Modernization Project
San Francisco, California

Source	Chemical	CAS Number	Cancer Potency Factor (CPF) $[mg/kg\text{-}day]^{-1}$	Chronic Reference Exposure Level (REL) $[\mu g/m^3]$
Diesel Off-Road Equipment	DPM	9901	1.1	5.0
Diesel On-Road Trucks	DPM	9901	1.1	5.0
Gasoline On-Road Vehicles	1,3-butadiene	106990	0.60	2.0
	Acetaldehyde	75070	0.010	140
	Acrolein	107028	--	0.35
	Benzene	71432	0.10	3.0
	Ethylbenzene	100414	0.0087	2,000
	Formaldehyde	50000	0.021	9.0
	Methanol	67561	--	4,000
	Naphthalene	91203	0.12	9.0
	n-Hexane	110543	--	7,000
	Propene	115071	--	3,000
	Styrene	100425	--	900
	Toluene	108883	--	300
	Xylene	1330207	--	700
Emergency Diesel Generators	DPM	9901	1.1	5.0

Notes:
The CPFs and chronic RELs were obtained from the California Environmental Protection Agency (Cal/EPA, 2016).
The speciation profile for on-road gasoline vehicles was obtained from the Bay Area Air Quality Management District's (BAAQMD's) Recommended Methods for Screening and Modeling Local Risks and Hazards, Table 14. Only chemicals with CPF and/or REL values are shown.

Abbreviations:
Cal/EPA = California Environmental Protection Agency
CAS = chemical abstract services
DPM = diesel particulate matter
-- = Not applicable
kg = kilogram
m^3 = cubic meter
mg = milligram
µg = microgram

Reference:
BAAQMD, 2011. Recommended Methods for Screening and Modeling Local Risks and Hazards.
Cal/EPA, 2016. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. March.

Table 4
Age Sensitivity Factors
Potrero Yard Modernization Project
San Francisco, California

Receptor Age Group	Age Sensitivity Factor (ASF)
Third Trimester	10
Age 0-2 Years	10
Age 2-16 Years	3
Age 16-30 Years	1

Reference:

Office of Environmental Health Hazard Assessment, 2015, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment, August.

APPENDIX A

PRELIMINARY PROJECT-SPECIFIC CONSTRUCTION INFORMATION

Preliminary Project-Specific Construction Information

	Demolition			Site Preparation, Grading, and Piling			Foundation			Building Construction			Paving			Architectural Coating		
Total Work Days	42			110			42			546			20			20		
Total Workers per Day[1]	30			50			100			450			25			30		
Total Vendor Truck Trips[2]	840			550			1050			13650			60			100		
Total Soil Haul Truck Trips[3]	5000			20044			200			100			20					
Total Concrete Truck Trips[4]	20			270			3300			2500			50					
Equipment	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**
Aerial Lifts																		
Air Compressors	2	8	Diesel	1	8	Diesel	1	8	Diesel	1	2	Diesel	1	4	Diesel			
Air Compressors	2	8	Electric	2	8	Electric	2	8	Electric	10	8	Electric				1	8	Electric
Bore/Drill Rigs	1	8	Electric															
Cement and Mortar Mixers							1	8	Diesel	1	6	Diesel	1	10	Diesel			
Concrete/Industrial Saws	1	8	Diesel				1	1	Diesel									
Cranes	2	8	Diesel	2	8	Diesel	1	4	Diesel	1	1	Diesel	1	2	Diesel			
Crawler Tractors																		
Crushing/Proc. Equipment																		
Dumpers/Tenders																		
Excavators[5]	2	8	Diesel	6	4	Diesel	2	8	Diesel	2	2.64	Diesel						
Forklifts	1	4	Propane	1	4	Propane	2	8	Propane	3	4	Propane				1	8	Propane
Generator Sets	1	4	Diesel	4	4	Diesel	4	8	Diesel	1	2.34	Diesel						
Graders				2	6	Diesel	1	4	Diesel									
Off-Highway Tractors																		
Off-Highway Trucks																		
Other Construction Equipment	1	1	Electric	15	8	Electric	15	8	Electric	30	8	Electric						
Other General Industrial Equipment							1	8	Diesel									
Other Material Handling Equipment				1	8	Electric	1	8	Electric	2	8	Electric	1	4	Electric			
Pavers													1	8	Diesel			
Paving Equipment													2	8	Diesel			
Plate Compactors				2	8	Propane	2	8	Propane	1	2.64	Propane	4	8	Propane			
Pressure Washers										1	1	Electric				1	1	Electric
Pumps	54	8	Electric	54	8	Electric	54	8	Electric	54	4	Electric	2	8	Electric	2	8	Electric
Rollers				1	8	Diesel	1	6	Diesel				2	6	Diesel			
Rough Terrain Forklifts	1	6	Diesel	2	4	Diesel	2	8	Diesel	2	4							
Rubber Tired Dozers	2	8	Diesel	2	4	Diesel	1	4	Diesel	1	2.64	Diesel	1	8	Diesel			
Rubber Tired Loaders	1	8	Diesel	2	8	Diesel	1	2	Diesel									
Scrapers													1	8	Diesel			
Signal Boards	4	8	Electric	4	8	Electric	4	8	Electric									
Skid Steer Loaders	1	8	Propane	1	2	Propane												
Surfacing Equipment																		
Sweepers/Scrubbers																		
Tractors/Loaders/Backhoes	3	8	Diesel	5	4	Diesel	3	8	Diesel	3	4	Diesel	1	8	Diesel			
Trenchers				1	4	Diesel												
Welders				2	4	Electric	2	8	Electric	33	5	Electric						
Slant Pile Drill				1	8	Diesel												
Soil Mix Drill Rig				1	8	Diesel												
Grout Plant				1	8	Diesel												
Soldier Pile Rig[6]				1	8	Diesel												
Tie Back Drill				1	8	Diesel												
Air Compressor for Tie Back Rig				1	8	Diesel												
Concrete Truck	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel			
Concrete Boom Pump	1	2	Diesel	1	4	Diesel	4	4	Diesel	3	3	Diesel	1	4	Diesel			
Scissor Lift							5	10	Electric	50	5	Electric	2	8	Electric	4	8	Electric
Tower Crane				1	8	Electric	2	10	Electric	4	12	Electric	4	2	Electric	4	2	Electric
Hoist (Construction Elevator)				1	4	Electric	1	8	Electric	2	12	Electric	2	12	Electric	2	12	Electric
Light Plant	4	6	Propane	4	6	Propane	4	6	Propane				2	8	Propane			
Recycling Plant	1	8		1	2													

Notes:

[1] In accordance with CalEEMod, assume single vehicle occupancy, a round trip distance of 21.6 miles, and a fleet mix of 50 percent light-duty auto, 25 percent light-duty truck type 1, and 25 percent light-duty truck type 2.

[2] In accordance with CalEEMod, assume a round trip distance of 14.6 miles and a fleet mix of 100 percent heavy heavy-duty trucks.

[3] In accordance with CalEEMod, assume a fleet mix of 100 percent heavy heavy-duty trucks. Conservatively assume a round trip distance of 110 miles to the Altamont Landfill in Livermore, which is near the border of the San Francisco Bay Area Air Basin.

[4] In accordance with CalEEMod, assume a round trip distance of 40 miles and a fleet mix of 100 percent heavy heavy-duty trucks.

[5] For the noise and vibration analysis, it will be conservatively assumed that excavators will be equipped with a hydraulic breaker (also known as a hoe ram) during bedrock removal.

[6] For the noise and vibration analysis, it will be conservatively assumed that impact pile driver methods will be used for pile installations.

[7] Assume 15 minutes onsite operation per concrete trip.

Appendix G-2

Construction Criteria Air Pollutant Calculations and
Supporting Documentation

Overview: Includes a summary of the estimated criteria air pollutant emissions by construction phase, as well as detailed estimates of criteria air pollutants emissions for each type of off-road construction equipment, on-road work trips, on-road truck trips, and off-gassing from paving and paint. Criteria air pollutants emissions from on-road construction vehicles were calculated using the summarized EMFAC2017 emissions factors.

Potrero Yard Modernization Project
Table G-2.1: Summary of Unmitigated Construction
Criteria Air Pollutant Emissions

Unmitigated NOx Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	3273.1	13249.4	4554.9	14171.5	1025.5	29.8	36304.3
On-Road Worker Trips	2.7	12.0	9.2	536.2	1.1	1.3	562.5
On-Road Truck Trips	5599.4	21898.0	1381.7	1947.5	4316.8	57.8	35201.2
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions (lb)	8875.3	35159.3	5945.8	16655.2	5343.4	88.9	72067.9
Average Daily Emissions (lb/day)[1]	11.4	45.1	7.6	21.4	6.9	0.1	92.4

Unmitigated ROG Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	13.6	51.9	19.8	64.5	4.4	0.1	154.4
On-Road Worker Trips	0.7	3.1	2.4	138.9	0.3	0.3	145.7
On-Road Truck Trips	77.6	293.6	26.5	39.0	115.9	1.1	553.7
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	28.9	15531.8	15560.8
Total Emissions (lb)	91.9	348.6	48.7	242.4	149.5	15533.5	16414.5
Average Daily Emissions (lb/day)[1]	0.1	0.4	0.1	0.3	0.2	19.9	21.0

Unmitigated PM10 Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	16.3	61.5	24.1	78.7	5.3	0.2	186.1
On-Road Worker Trips	0.1	0.5	0.4	21.6	0.0	0.1	22.7
On-Road Truck Trips	30.5	120.2	6.8	9.4	18.1	0.3	185.3
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions (lb)	46.9	182.2	31.3	109.8	23.4	0.5	394.1
Average Daily Emissions (lb/day)[1]	0.1	0.2	0.0	0.1	0.0	0.0	0.5

Unmitigated PM2.5 Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	16.3	61.5	24.1	78.7	5.3	0.2	186.1
On-Road Worker Trips	0.1	0.4	0.3	19.9	0.0	0.0	20.9
On-Road Truck Trips	29.2	115.0	6.5	9.0	17.3	0.3	177.3
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions (lb)	45.6	176.9	31.0	107.6	22.6	0.5	384.3
Average Daily Emissions (lb/day)[1]	0.1	0.2	0.0	0.1	0.0	0.0	0.5

[1] Average daily emissions based on the total duration of construction activities (780 work days).

Potrero Yard Modernization Project
Table G-2.2: Summary of Mitigated Construction
Criteria Air Pollutant Emissions

Mitigated NOx Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	349.7	1404.0	449.3	1149.1	151.9	1.6	3505.7
On-Road Worker Trips	2.7	12.0	9.2	536.2	1.1	1.3	562.5
On-Road Truck Trips	5599.4	21898.0	1381.7	1947.5	4316.8	57.8	35201.2
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions (lb)	5951.8	23313.9	1840.2	3632.8	4469.8	60.7	39269.4
Average Daily Emissions (lb/day)[1]	7.6	29.9	2.4	4.7	5.7	0.1	50.3

Mitigated ROG Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	48.2	197.4	66.8	195.6	16.7	0.4	525.0
On-Road Worker Trips	0.7	3.1	2.4	138.9	0.3	0.3	145.7
On-Road Truck Trips	77.6	293.6	26.5	39.0	115.9	1.1	553.7
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	28.9	15531.8	15560.8
Total Emissions (lb)	126.4	494.1	95.6	373.5	161.8	15533.7	16785.1
Average Daily Emissions (lb/day)[1]	0.2	0.6	0.1	0.5	0.2	19.9	21.5

Mitigated PM10 Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	5.9	24.3	8.3	25.0	1.9	0.1	65.6
On-Road Worker Trips	0.1	0.5	0.4	21.6	0.0	0.1	22.7
On-Road Truck Trips	30.5	120.2	6.8	9.4	18.1	0.3	185.3
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions (lb)	36.5	145.0	15.5	56.1	20.1	0.4	273.6
Average Daily Emissions (lb/day)[1]	0.0	0.2	0.0	0.1	0.0	0.0	0.4

Mitigated PM2.5 Emissions during Construction (lb/Phase)

Source	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating	TOTAL
Off-Road Equipment	5.9	24.3	8.3	25.0	1.9	0.1	65.6
On-Road Worker Trips	0.1	0.4	0.3	19.9	0.0	0.0	20.9
On-Road Truck Trips	29.2	115.0	6.5	9.0	17.3	0.3	177.3
Off-Gasing from Paving and Paint	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions (lb)	35.2	139.8	15.2	53.9	19.3	0.4	263.8
Average Daily Emissions (lb/day)[1]	0.0	0.2	0.0	0.1	0.0	0.0	0.3

[1] Average daily emissions based on the total duration of construction activities (780 work days).

Table G-2.3: Preliminary Project-Specific Construction Information

	Demolition			Site Preparation, Grading, and Piling			Foundation			Building Construction			Paving			Architectural Coating		
Total Work Days	42			110			42			546			20			20		
Total Workers per Day[1]	30			50			100			450			25			30		
Total Vendor Truck Trips[2]	840			550			1050			13650			60			100		
Total Soil Haul Truck Trips[3]	5000			20044			200			100			20					
Total Concrete Truck Trips[4]	20			270			3300			2500			50					
Equipment	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**	**# of Equipment**	**Hours/Day**	**Fuel Type**
Aerial Lifts																		
Air Compressors	2	8	Diesel	1	8	Diesel	1	8	Diesel	1	2	Diesel	1	4	Diesel			
Air Compressors	2	8	Electric	2	8	Electric	2	8	Electric	10	8	Electric				1	8	Electric
Bore/Drill Rigs	1	8	Electric															
Cement and Mortar Mixers							1	8	Diesel	1	6	Diesel	1	10	Diesel			
Concrete/Industrial Saws	1	8	Diesel				1	1	Diesel									
Cranes	2	8	Diesel	2	8	Diesel	1	4	Diesel	1	1	Diesel	1	2	Diesel			
Crawler Tractors																		
Crushing/Proc. Equipment																		
Dumpers/Tenders																		
Excavators[5]	2	8	Diesel	6	4	Diesel	2	8	Diesel	2	2.64	Diesel						
Forklifts	1	4	Propane	1	4	Propane	2	8	Propane	3	4	Propane				1	8	Propane
Generator Sets	1	4	Diesel	4	4	Diesel	4	8	Diesel	1	2.34	Diesel						
Graders				2	6	Diesel	1	4	Diesel									
Off-Highway Tractors																		
Off-Highway Trucks																		
Other Construction Equipment	1	1	Electric	15	8	Electric	15	8	Electric	30	8	Electric						
Other General Industrial Equipment							1	8	Diesel									
Other Material Handling Equipment				1	8	Electric	1	8	Electric	2	8	Electric	1	4	Electric			
Pavers													1	8	Diesel			
Paving Equipment													2	8	Diesel			
Plate Compactors				2	8	Propane	2	8	Propane	1	2.64	Propane	4	8	Propane			
Pressure Washers										1	1	Electric				1	1	Electric
Pumps	54	8	Electric	54	8	Electric	54	8	Electric	54	4	Electric	2	8	Electric	2	8	Electric
Rollers				1	8	Diesel	1	6	Diesel				2	6	Diesel			
Rough Terrain Forklifts	1	6	Diesel	2	4	Diesel	2	8	Diesel	2	4							
Rubber Tired Dozers	2	8	Diesel	2	4	Diesel	1	4	Diesel	1	2.64	Diesel	1	8	Diesel			
Rubber Tired Loaders	1	8	Diesel	2	8	Diesel	1	2	Diesel									
Scrapers													1	8	Diesel			
Signal Boards	4	8	Electric	4	8	Electric	4	8	Electric									
Skid Steer Loaders	1	8	Propane	1	2	Propane												
Surfacing Equipment																		
Sweepers/Scrubbers																		
Tractors/Loaders/Backhoes	3	8	Diesel	5	4	Diesel	3	8	Diesel	3	4	Diesel	1	8	Diesel			
Trenchers				1	4	Diesel												
Welders				2	4	Electric	2	8	Electric	33	5	Electric						
Slant Pile Drill				1	8	Diesel												
Soil Mix Drill Rig				1	8	Diesel												
Grout Plant				1	8	Diesel												
Soldier Pile Rig[6]				1	8	Diesel												
Tie Back Drill				1	8	Diesel												
Air Compressor for Tie Back Rig				1	8	Diesel												
Concrete Truck	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel	See Note 7	See Note 7	Diesel			
Concrete Boom Pump	1	2	Diesel	1	4	Diesel	4	4	Diesel	3	3	Diesel	1	4	Diesel			
Scissor Lift							5	10	Electric	50	5	Electric	2	8	Electric	4	8	Electric
Tower Crane				1	8	Electric	2	10	Electric	4	12	Electric	4	2	Electric	4	2	Electric
Hoist (Construction Elevator)				1	4	Electric	1	8	Electric	2	12	Electric	2	12	Electric	2	12	Electric
Light Plant	4	6	Propane	4	6	Propane	4	6	Propane				2	8	Propane			
Recycling Plant	1	8		1	2													

Notes:

[1] In accordance with CalEEMod, assume single vehicle occupancy, a round trip distance of 21.6 miles, and a fleet mix of 50 percent light-duty auto, 25 percent light-duty truck type 1, and 25 percent light-duty truck type 2.

[2] In accordance with CalEEMod, assume a round trip distance of 14.6 miles and a fleet mix of 100 percent heavy heavy-duty trucks.

[3] In accordance with CalEEMod, assume a fleet mix of 100 percent heavy heavy-duty trucks. Conservatively assume a round trip distance of 110 miles to the Altamont Landfill in Livermore, which is near the border of the San Francisco Bay Area Air Basin.

[4] In accordance with CalEEMod, assume a round trip distance of 40 miles and a fleet mix of 100 percent heavy heavy-duty trucks.

[5] For the noise and vibration analysis, it will be conservatively assumed that excavators will be equipped with a hydraulic breaker (also known as a hoe ram) during bedrock removal.

[6] For the noise and vibration analysis, it will be conservatively assumed that impact pile driver methods will be used for pile installations.

[7] Assume 15 minutes onsite operation per concrete trip.

Potrero Yard Modernization Project
Table G-2.4: Off-Road Equipment Criteria Air Pollutant Emissions

Unmitigated Off-Road Equipment NOx Emissions (pounds)

Equipment	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	Exhaust Control	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Aerial Lifts	Aerial Lifts	Diesel	63	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	Air Compressors	Diesel	78	Tier 2	Level 3 DPF	263.23	344.71	131.62	427.76	31.34	0.00
Air Compressors	Air Compressors	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs	Bore/Drill Rigs	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Cement and Mortar Mixers	Cement and Mortar Mixers	Diesel	25	Tier 2	Level 3 DPF	0.00	0.00	47.97	467.73	28.56	0.00
Concrete/Industrial Saws	Concrete/Industrial Saws	Diesel	81	Tier 2	Level 3 DPF	207.87	0.00	25.98	0.00	0.00	0.00
Cranes	Cranes	Diesel	231	Tier 2	Level 3 DPF	411.50	1077.74	102.88	334.35	24.49	0.00
Crawler Tractors	Crawler Tractors	Diesel	212	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment	Crushing/Proc. Equipment	Diesel	85	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Dumpers/Tenders	Dumpers/Tenders	Diesel	25	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	Excavators	Diesel	158	Tier 2	Level 3 DPF	370.59	1455.88	370.59	1588.23	0.00	0.00
Forklifts	Forklifts	Diesel	89	Tier 2	Level 3 DPF	31.29	81.94	125.15	1220.20	0.00	29.80
Generator Sets	Generator Sets	Diesel	84	Tier 2	Level 3 DPF	109.26	1144.62	874.07	832.45	0.00	0.00
Graders	Graders	Diesel	187	Tier 2	Level 3 DPF	0.00	925.11	117.74	0.00	0.00	0.00
Off-Highway Tractors	Off-Highway Tractors	Diesel	124	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Off-Highway Trucks	Off-Highway Trucks	Diesel	402	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Other Construction Equipment	Other Construction Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Other General Industrial Equipment	Other General Industrial Equipment	Diesel	88	Tier 2	Level 3 DPF	0.00	0.00	105.18	0.00	0.00	0.00
Other Material Handling Equipment	Other Material Handling Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pavers	Pavers	Diesel	130	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	80.24	0.00
Paving Equipment	Paving Equipment	Diesel	132	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	139.67	0.00
Plate Compactors	Plate Compactors	Diesel	25	Tier 2	Level 3 DPF	0.00	192.95	73.67	157.87	70.16	0.00
Pressure Washers	Pressure Washers	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	Pumps	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	Rollers	Diesel	80	Tier 2	Level 3 DPF	0.00	279.89	80.15	0.00	76.33	0.00
Rough Terrain Forklifts	Rollers	Diesel	80	Tier 2	Level 3 DPF	80.15	279.89	213.74	1389.29	0.00	0.00
Rubber Tired Dozers	Rubber Tired Dozers	Diesel	247	Tier 2	Level 3 DPF	606.90	794.75	151.73	1300.50	144.50	0.00
Rubber Tired Loaders	Rubber Tired Loaders	Diesel	203	Tier 2	Level 3 DPF	224.46	1175.72	56.11	0.00	0.00	0.00
Scrapers	Scrapers	Diesel	367	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	235.29	0.00
Signal Boards	Signal Boards	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer Loaders	Skid Steer Loaders	Diesel	65	Tier 2	Level 3 DPF	84.55	55.36	0.00	0.00	0.00	0.00
Surfacing Equipment	Surfacing Equipment	Diesel	263	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Sweepers/Scrubbers	Sweepers/Scrubbers	Diesel	64	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	97	Tier 2	Level 3 DPF	378.51	826.10	378.51	2460.28	60.08	0.00
Trenchers	Trenchers	Diesel	78	Tier 2	Level 3 DPF	0.00	179.54	0.00	0.00	0.00	0.00
Welders	Welders	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Slant Pile Drill	Skid Steer Loaders	Diesel	65	Tier 2	Level 3 DPF	0.00	221.43	0.00	0.00	0.00	0.00
Soil Mix Drill Rig	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	888.87	0.00	0.00	0.00	0.00
Grout Plant	Cement and Mortar Mixers	Diesel	25	Tier 2	Level 3 DPF	0.00	125.64	0.00	0.00	0.00	0.00
Soldier Pile Rig	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	888.87	0.00	0.00	0.00	0.00
Tie Back Drill	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	888.87	0.00	0.00	0.00	0.00
Air Compressor for Tie Back Rig	Air Compressors	Diesel	78	Tier 2	Level 3 DPF	0.00	344.71	0.00	0.00	0.00	0.00
Concrete Truck	Off-Highway Trucks	Diesel	402	Tier 2	Level 3 DPF	6.38	86.08	1052.08	797.03	15.94	0.00
Concrete Boom Pump	Pumps	Diesel	84	Tier 2	Level 3 DPF	54.63	286.16	437.04	3195.83	52.03	0.00
Scissor Lift	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Tower Crane	Cranes	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Hoist (Construction Elevator)	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Light Plant	Signal Boards	Diesel	25	Tier 2	Level 3 DPF	210.74	551.93	210.74	0.00	66.90	0.00
Recycling Plant	Crushing/Proc. Equipment	Diesel	85	Tier 2	Level 3 DPF	233.07	152.61	0.00	0.00	0.00	0.00
					Project Emissions (lbs/phase)	3273.11	13249.37	4554.93	14171.52	1025.54	29.80
					Project Emissions (tons/phase)	1.64	6.62	2.28	7.09	0.51	0.01

Potrero Yard Modernization Project
Table G-2.4: Off-Road Equipment Criteria Air Pollutant Emissions

Unmitigated Off-Road Equipment ROG Emissions (pounds)

Equipment	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	Exhaust Control	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Aerial Lifts	Aerial Lifts	Diesel	63	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	Air Compressors	Diesel	78	Tier 2	Level 3 DPF	1.27	1.67	0.64	2.07	0.15	0.00
Air Compressors	Air Compressors	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs	Bore/Drill Rigs	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Cement and Mortar Mixers	Cement and Mortar Mixers	Diesel	25	Tier 2	Level 3 DPF	0.00	0.00	0.30	2.93	0.18	0.00
Concrete/Industrial Saws	Concrete/Industrial Saws	Diesel	81	Tier 2	Level 3 DPF	1.01	0.00	0.13	0.00	0.00	0.00
Cranes	Cranes	Diesel	231	Tier 2	Level 3 DPF	1.19	3.12	0.30	0.97	0.07	0.00
Crawler Tractors	Crawler Tractors	Diesel	212	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment	Crushing/Proc. Equipment	Diesel	85	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Dumpers/Tenders	Dumpers/Tenders	Diesel	25	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	Excavators	Diesel	158	Tier 2	Level 3 DPF	1.69	6.63	1.69	7.24	0.00	0.00
Forklifts	Forklifts	Diesel	89	Tier 2	Level 3 DPF	0.15	0.40	0.61	5.91	0.00	0.14
Generator Sets	Generator Sets	Diesel	84	Tier 2	Level 3 DPF	0.53	5.54	4.23	4.03	0.00	0.00
Graders	Graders	Diesel	187	Tier 2	Level 3 DPF	0.00	2.68	0.34	0.00	0.00	0.00
Off-Highway Tractors	Off-Highway Tractors	Diesel	124	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Off-Highway Trucks	Off-Highway Trucks	Diesel	402	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Other Construction Equipment	Other Construction Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Other General Industrial Equipment	Other General Industrial Equipment	Diesel	88	Tier 2	Level 3 DPF	0.00	0.00	0.51	0.00	0.00	0.00
Other Material Handling Equipment	Other Material Handling Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pavers	Pavers	Diesel	130	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.37	0.00
Paving Equipment	Paving Equipment	Diesel	132	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.64	0.00
Plate Compactors	Plate Compactors	Diesel	25	Tier 2	Level 3 DPF	0.00	1.21	0.46	0.99	0.44	0.00
Pressure Washers	Pressure Washers	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	Pumps	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	Rollers	Diesel	80	Tier 2	Level 3 DPF	0.00	1.36	0.39	0.00	0.37	0.00
Rough Terrain Forklifts	Rollers	Diesel	80	Tier 2	Level 3 DPF	0.39	1.36	1.03	6.73	0.00	0.00
Rubber Tired Dozers	Rubber Tired Dozers	Diesel	247	Tier 2	Level 3 DPF	1.75	2.30	0.44	3.76	0.42	0.00
Rubber Tired Loaders	Rubber Tired Loaders	Diesel	203	Tier 2	Level 3 DPF	0.65	3.40	0.16	0.00	0.00	0.00
Scrapers	Scrapers	Diesel	367	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.74	0.00
Signal Boards	Signal Boards	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer Loaders	Skid Steer Loaders	Diesel	65	Tier 2	Level 3 DPF	0.41	0.27	0.00	0.00	0.00	0.00
Surfacing Equipment	Surfacing Equipment	Diesel	263	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Sweepers/Scrubbers	Sweepers/Scrubbers	Diesel	64	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	97	Tier 2	Level 3 DPF	1.83	4.00	1.83	11.91	0.29	0.00
Trenchers	Trenchers	Diesel	78	Tier 2	Level 3 DPF	0.00	0.87	0.00	0.00	0.00	0.00
Welders	Welders	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Slant Pile Drill	Skid Steer Loaders	Diesel	65	Tier 2	Level 3 DPF	0.00	1.07	0.00	0.00	0.00	0.00
Soil Mix Drill Rig	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	2.57	0.00	0.00	0.00	0.00
Grout Plant	Cement and Mortar Mixers	Diesel	25	Tier 2	Level 3 DPF	0.00	0.79	0.00	0.00	0.00	0.00
Soldier Pile Rig	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	2.57	0.00	0.00	0.00	0.00
Tie Back Drill	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	2.57	0.00	0.00	0.00	0.00
Air Compressor for Tie Back Rig	Air Compressors	Diesel	78	Tier 2	Level 3 DPF	0.00	1.67	0.00	0.00	0.00	0.00
Concrete Truck	Off-Highway Trucks	Diesel	402	Tier 2	Level 3 DPF	0.02	0.27	3.33	2.52	0.05	0.00
Concrete Boom Pump	Pumps	Diesel	84	Tier 2	Level 3 DPF	0.26	1.39	2.12	15.47	0.25	0.00
Scissor Lift	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Tower Crane	Cranes	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Hoist (Construction Elevator)	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Light Plant	Signal Boards	Diesel	25	Tier 2	Level 3 DPF	1.32	3.46	1.32	0.00	0.42	0.00
Recycling Plant	Crushing/Proc. Equipment	Diesel	85	Tier 2	Level 3 DPF	1.13	0.74	0.00	0.00	0.00	0.00
					Project Emissions (lbs/phase)	13.61	51.88	19.82	64.53	4.39	0.14
					Project Emissions (tons/phase)	7.E-03	3.E-02	1.E-02	3.E-02	2.E-03	7.E-05

Potrero Yard Modernization Project
Table G-2.4: Off-Road Equipment Criteria Air Pollutant Emissions

Unmitigated Off-Road Equipment PM Emissions (pounds)

Equipment	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	Exhaust Control	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Aerial Lifts	Aerial Lifts	Diesel	63	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	Air Compressors	Diesel	78	Tier 2	Level 3 DPF	1.60	2.09	0.80	2.59	0.19	0.00
Air Compressors	Air Compressors	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs	Bore/Drill Rigs	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Cement and Mortar Mixers	Cement and Mortar Mixers	Diesel	25	Tier 2	Level 3 DPF	0.00	0.00	0.44	4.24	0.26	0.00
Concrete/Industrial Saws	Concrete/Industrial Saws	Diesel	81	Tier 2	Level 3 DPF	1.26	0.00	0.16	0.00	0.00	0.00
Cranes	Cranes	Diesel	231	Tier 2	Level 3 DPF	1.31	3.43	0.33	1.06	0.08	0.00
Crawler Tractors	Crawler Tractors	Diesel	212	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment	Crushing/Proc. Equipment	Diesel	85	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Dumpers/Tenders	Dumpers/Tenders	Diesel	25	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	Excavators	Diesel	158	Tier 2	Level 3 DPF	1.71	6.70	1.71	7.31	0.00	0.00
Forklifts	Forklifts	Diesel	89	Tier 2	Level 3 DPF	0.19	0.50	0.76	7.40	0.00	0.18
Generator Sets	Generator Sets	Diesel	84	Tier 2	Level 3 DPF	0.66	6.94	5.30	5.05	0.00	0.00
Graders	Graders	Diesel	187	Tier 2	Level 3 DPF	0.00	2.94	0.37	0.00	0.00	0.00
Off-Highway Tractors	Off-Highway Tractors	Diesel	124	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Off-Highway Trucks	Off-Highway Trucks	Diesel	402	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Other Construction Equipment	Other Construction Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Other General Industrial Equipment	Other General Industrial Equipment	Diesel	88	Tier 2	Level 3 DPF	0.00	0.00	0.64	0.00	0.00	0.00
Other Material Handling Equipment	Other Material Handling Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pavers	Pavers	Diesel	130	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.37	0.00
Paving Equipment	Paving Equipment	Diesel	132	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.64	0.00
Plate Compactors	Plate Compactors	Diesel	25	Tier 2	Level 3 DPF	0.00	1.75	0.67	1.43	0.64	0.00
Pressure Washers	Pressure Washers	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	Pumps	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	Rollers	Diesel	80	Tier 2	Level 3 DPF	0.00	1.70	0.49	0.00	0.46	0.00
Rough Terrain Forklifts	Rollers	Diesel	80	Tier 2	Level 3 DPF	0.49	1.70	1.30	8.42	0.00	0.00
Rubber Tired Dozers	Rubber Tired Dozers	Diesel	247	Tier 2	Level 3 DPF	1.93	2.53	0.48	4.14	0.46	0.00
Rubber Tired Loaders	Rubber Tired Loaders	Diesel	203	Tier 2	Level 3 DPF	0.71	3.74	0.18	0.00	0.00	0.00
Scrapers	Scrapers	Diesel	367	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.82	0.00
Signal Boards	Signal Boards	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer Loaders	Skid Steer Loaders	Diesel	65	Tier 2	Level 3 DPF	0.51	0.34	0.00	0.00	0.00	0.00
Surfacing Equipment	Surfacing Equipment	Diesel	263	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Sweepers/Scrubbers	Sweepers/Scrubbers	Diesel	64	Tier 2	Level 3 DPF	0.00	0.00	0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	97	Tier 2	Level 3 DPF	2.29	5.01	2.29	14.92	0.36	0.00
Trenchers	Trenchers	Diesel	78	Tier 2	Level 3 DPF	0.00	1.09	0.00	0.00	0.00	0.00
Welders	Welders	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Slant Pile Drill	Skid Steer Loaders	Diesel	65	Tier 2	Level 3 DPF	0.00	1.34	0.00	0.00	0.00	0.00
Soil Mix Drill Rig	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	2.83	0.00	0.00	0.00	0.00
Grout Plant	Cement and Mortar Mixers	Diesel	25	Tier 2	Level 3 DPF	0.00	1.14	0.00	0.00	0.00	0.00
Soldier Pile Rig	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	2.83	0.00	0.00	0.00	0.00
Tie Back Drill	Bore/Drill Rigs	Diesel	221	Tier 2	Level 3 DPF	0.00	2.83	0.00	0.00	0.00	0.00
Air Compressor for Tie Back Rig	Air Compressors	Diesel	78	Tier 2	Level 3 DPF	0.00	2.09	0.00	0.00	0.00	0.00
Concrete Truck	Off-Highway Trucks	Diesel	402	Tier 2	Level 3 DPF	0.02	0.30	3.66	2.78	0.06	0.00
Concrete Boom Pump	Pumps	Diesel	84	Tier 2	Level 3 DPF	0.33	1.74	2.65	19.38	0.32	0.00
Scissor Lift	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Tower Crane	Cranes	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Hoist (Construction Elevator)	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Light Plant	Signal Boards	Diesel	25	Tier 2	Level 3 DPF	1.91	5.01	1.91	0.00	0.61	0.00
Recycling Plant	Crushing/Proc. Equipment	Diesel	85	Tier 2	Level 3 DPF	1.41	0.93	0.00	0.00	0.00	0.00
					Project Emissions (lbs/phase)	16.34	61.47	24.13	78.72	5.26	0.18
					Project Emissions (tons/phase)	0.008	0.031	0.012	0.039	0.003	0.000

Potrero Yard Modernization Project
Table G-2.5: Off-Road Equipment Criteria Air Pollutant Emissions

Mitigated Off-Road Equipment NOx Emissions (pounds)

Equipment	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	Exhaust Control	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Aerial Lifts	Aerial Lifts	Diesel	63	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	Air Compressors	Diesel	78	Tier 4	---	14.41	18.87	7.20	23.41	1.72	0.00
Air Compressors	Air Compressors	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs	Bore/Drill Rigs	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Cement and Mortar Mixers	Cement and Mortar Mixers	Diesel	25	Tier 4	---	0.00	0.00	28.49	277.81	16.96	0.00
Concrete/Industrial Saws	Concrete/Industrial Saws	Diesel	81	Tier 4	---	11.38	0.00	1.42	0.00	0.00	0.00
Cranes	Cranes	Diesel	231	Tier 4	---	25.78	67.52	6.45	20.95	1.53	0.00
Crawler Tractors	Crawler Tractors	Diesel	212	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment	Crushing/Proc. Equipment	Diesel	85	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Dumpers/Tenders	Dumpers/Tenders	Diesel	25	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	Excavators	Diesel	158	Tier 4	---	23.11	90.77	23.11	99.03	0.00	0.00
Forklifts	Forklifts	Diesel	89	Tier 4	---	1.71	4.49	6.85	66.79	0.00	1.63
Generator Sets	Generator Sets	Diesel	84	Tier 4	---	5.98	62.65	47.84	45.57	0.00	0.00
Graders	Graders	Diesel	187	Tier 4	---	0.00	57.96	7.38	0.00	0.00	0.00
Off-Highway Tractors	Off-Highway Tractors	Diesel	124	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Off-Highway Trucks	Off-Highway Trucks	Diesel	402	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Other Construction Equipment	Other Construction Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Other General Industrial Equipment	Other General Industrial Equipment	Diesel	88	Tier 4	---	0.00	0.00	5.76	0.00	0.00	0.00
Other Material Handling Equipment	Other Material Handling Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pavers	Pavers	Diesel	130	Tier 4	---	0.00	0.00	0.00	0.00	5.00	0.00
Paving Equipment	Paving Equipment	Diesel	132	Tier 4	---	0.00	0.00	0.00	0.00	8.71	0.00
Plate Compactors	Plate Compactors	Diesel	25	Tier 4	---	0.00	114.60	43.76	93.77	41.67	0.00
Pressure Washers	Pressure Washers	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	Pumps	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	Rollers	Diesel	80	Tier 4	---	0.00	15.32	4.39	0.00	4.18	0.00
Rough Terrain Forklifts	Rollers	Diesel	80	Tier 4	---	4.39	15.32	11.70	76.05	0.00	0.00
Rubber Tired Dozers	Rubber Tired Dozers	Diesel	247	Tier 4	---	38.02	49.79	9.51	81.48	9.05	0.00
Rubber Tired Loaders	Rubber Tired Loaders	Diesel	203	Tier 4	---	14.06	73.66	3.52	0.00	0.00	0.00
Scrapers	Scrapers	Diesel	367	Tier 4	---	0.00	0.00	0.00	0.00	16.14	0.00
Signal Boards	Signal Boards	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer Loaders	Skid Steer Loaders	Diesel	65	Tier 4	---	48.77	31.93	0.00	0.00	0.00	0.00
Surfacing Equipment	Surfacing Equipment	Diesel	263	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Sweepers/Scrubbers	Sweepers/Scrubbers	Diesel	64	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	97	Tier 4	---	20.72	45.22	20.72	134.67	3.29	0.00
Trenchers	Trenchers	Diesel	78	Tier 4	---	0.00	9.83	0.00	0.00	0.00	0.00
Welders	Welders	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Slant Pile Drill	Skid Steer Loaders	Diesel	65	Tier 4	---	0.00	127.73	0.00	0.00	0.00	0.00
Soil Mix Drill Rig	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.00	55.69	0.00	0.00	0.00	0.00
Grout Plant	Cement and Mortar Mixers	Diesel	25	Tier 4	---	0.00	74.63	0.00	0.00	0.00	0.00
Soldier Pile Rig	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.00	55.69	0.00	0.00	0.00	0.00
Tie Back Drill	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.00	55.69	0.00	0.00	0.00	0.00
Air Compressor for Tie Back Rig	Air Compressors	Diesel	78	Tier 4	---	0.00	18.87	0.00	0.00	0.00	0.00
Concrete Truck	Off-Highway Trucks	Diesel	402	Tier 4	---	0.44	5.91	72.17	54.68	1.09	0.00
Concrete Boom Pump	Pumps	Diesel	84	Tier 4	---	2.99	15.66	23.92	174.93	2.85	0.00
Scissor Lift	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Tower Crane	Cranes	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Hoist (Construction Elevator)	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Light Plant	Signal Boards	Diesel	25	Tier 4	---	125.17	327.82	125.17	0.00	39.74	0.00
Recycling Plant	Crushing/Proc. Equipment	Diesel	85	Tier 4	---	12.76	8.35	0.00	0.00	0.00	0.00
					Project Emissions (lbs/phase)	349.68	1403.96	449.35	1149.12	151.93	1.63
					Project Emissions (tons/phase)	0.17	0.70	0.22	0.57	0.08	0.00

Potrero Yard Modernization Project
Table G-2.5: Off-Road Equipment Criteria Air Pollutant Emissions

Mitigated Off-Road Equipment ROG Emissions (pounds)

Equipment	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	Exhaust Control	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Aerial Lifts	Aerial Lifts	Diesel	63	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	Air Compressors	Diesel	78	Tier 4	---	3.33	4.35	1.66	5.40	0.40	0.00
Air Compressors	Air Compressors	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs	Bore/Drill Rigs	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Cement and Mortar Mixers	Cement and Mortar Mixers	Diesel	25	Tier 4	---	0.00	0.00	1.24	12.12	0.74	0.00
Concrete/Industrial Saws	Concrete/Industrial Saws	Diesel	81	Tier 4	---	2.63	0.00	0.33	0.00	0.00	0.00
Cranes	Cranes	Diesel	231	Tier 4	---	5.95	15.58	1.49	4.83	0.35	0.00
Crawler Tractors	Crawler Tractors	Diesel	212	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment	Crushing/Proc. Equipment	Diesel	85	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Dumpers/Tenders	Dumpers/Tenders	Diesel	25	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	Excavators	Diesel	158	Tier 4	---	5.33	20.95	5.33	22.85	0.00	0.00
Forklifts	Forklifts	Diesel	89	Tier 4	---	0.40	1.04	1.58	15.41	0.00	0.38
Generator Sets	Generator Sets	Diesel	84	Tier 4	---	1.38	14.46	11.04	10.52	0.00	0.00
Graders	Graders	Diesel	187	Tier 4	---	0.00	13.38	1.70	0.00	0.00	0.00
Off-Highway Tractors	Off-Highway Tractors	Diesel	124	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Off-Highway Trucks	Off-Highway Trucks	Diesel	402	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Other Construction Equipment	Other Construction Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Other General Industrial Equipment	Other General Industrial Equipment	Diesel	88	Tier 4	---	0.00	0.00	1.33	0.00	0.00	0.00
Other Material Handling Equipment	Other Material Handling Equipment	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pavers	Pavers	Diesel	130	Tier 4	---	0.00	0.00	0.00	0.00	1.15	0.00
Paving Equipment	Paving Equipment	Diesel	132	Tier 4	---	0.00	0.00	0.00	0.00	2.01	0.00
Plate Compactors	Plate Compactors	Diesel	25	Tier 4	---	0.00	5.00	1.91	4.09	1.82	0.00
Pressure Washers	Pressure Washers	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	Pumps	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	Rollers	Diesel	80	Tier 4	---	0.00	3.54	1.01	0.00	0.96	0.00
Rough Terrain Forklifts	Rollers	Diesel	80	Tier 4	---	1.01	3.54	2.70	17.55	0.00	0.00
Rubber Tired Dozers	Rubber Tired Dozers	Diesel	247	Tier 4	---	8.77	11.49	2.19	18.80	2.09	0.00
Rubber Tired Loaders	Rubber Tired Loaders	Diesel	203	Tier 4	---	3.25	17.00	0.81	0.00	0.00	0.00
Scrapers	Scrapers	Diesel	367	Tier 4	---	0.00	0.00	0.00	0.00	3.72	0.00
Signal Boards	Signal Boards	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer Loaders	Skid Steer Loaders	Diesel	65	Tier 4	---	2.14	1.40	0.00	0.00	0.00	0.00
Surfacing Equipment	Surfacing Equipment	Diesel	263	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Sweepers/Scrubbers	Sweepers/Scrubbers	Diesel	64	Tier 4	---	0.00	0.00	0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	97	Tier 4	---	4.78	10.43	4.78	31.08	0.76	0.00
Trenchers	Trenchers	Diesel	78	Tier 4	---	0.00	2.27	0.00	0.00	0.00	0.00
Welders	Welders	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Slant Pile Drill	Skid Steer Loaders	Diesel	65	Tier 4	---	0.00	5.59	0.00	0.00	0.00	0.00
Soil Mix Drill Rig	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.00	12.85	0.00	0.00	0.00	0.00
Grout Plant	Cement and Mortar Mixers	Diesel	25	Tier 4	---	0.00	3.26	0.00	0.00	0.00	0.00
Soldier Pile Rig	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.00	12.85	0.00	0.00	0.00	0.00
Tie Back Drill	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.00	12.85	0.00	0.00	0.00	0.00
Air Compressor for Tie Back Rig	Air Compressors	Diesel	78	Tier 4	---	0.00	4.35	0.00	0.00	0.00	0.00
Concrete Truck	Off-Highway Trucks	Diesel	402	Tier 4	---	0.10	1.36	16.66	12.62	0.25	0.00
Concrete Boom Pump	Pumps	Diesel	84	Tier 4	---	0.69	3.61	5.52	40.37	0.66	0.00
Scissor Lift	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Tower Crane	Cranes	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Hoist (Construction Elevator)	Aerial Lifts	Electric	0	---	---	0.00	0.00	0.00	0.00	0.00	0.00
Light Plant	Signal Boards	Diesel	25	Tier 4	---	5.46	14.30	5.46	0.00	1.73	0.00
Recycling Plant	Crushing/Proc. Equipment	Diesel	85	Tier 4	---	2.94	1.93	0.00	0.00	0.00	0.00
					Project Emissions (lbs/phase)	48.15	197.38	66.75	195.65	16.65	0.38
					Project Emissions (tons/phase)	2.E-02	1.E-01	3.E-02	1.E-01	8.E-03	2.E-04

Potrero Yard Modernization Project
Table G-2.5: Off-Road Equipment Criteria Air Pollutant Emissions

Mitigated Off-Road Equipment PM Emissions (pounds)

Equipment	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	Exhaust Control	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Aerial Lifts	Aerial Lifts	Diesel	63	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Air Compressors	Air Compressors	Diesel	78	Tier 4	---	0.443	0.581	0.222	0.720	0.053	0.000
Air Compressors	Air Compressors	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Bore/Drill Rigs	Bore/Drill Rigs	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Cement and Mortar Mixers	Cement and Mortar Mixers	Diesel	25	Tier 4	---	0.000	0.000	0.083	0.808	0.049	0.000
Concrete/Industrial Saws	Concrete/Industrial Saws	Diesel	81	Tier 4	---	0.350	0.000	0.044	0.000	0.000	0.000
Cranes	Cranes	Diesel	231	Tier 4	---	0.793	2.078	0.198	0.645	0.047	0.000
Crawler Tractors	Crawler Tractors	Diesel	212	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Crushing/Proc. Equipment	Crushing/Proc. Equipment	Diesel	85	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Dumpers/Tenders	Dumpers/Tenders	Diesel	25	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Excavators	Excavators	Diesel	158	Tier 4	---	0.711	2.793	0.711	3.047	0.000	0.000
Forklifts	Forklifts	Diesel	89	Tier 4	---	0.053	0.138	0.211	2.055	0.000	0.050
Generator Sets	Generator Sets	Diesel	84	Tier 4	---	0.184	1.928	1.472	1.402	0.000	0.000
Graders	Graders	Diesel	187	Tier 4	---	0.000	1.783	0.227	0.000	0.000	0.000
Off-Highway Tractors	Off-Highway Tractors	Diesel	124	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Off-Highway Trucks	Off-Highway Trucks	Diesel	402	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Other Construction Equipment	Other Construction Equipment	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Other General Industrial Equipment	Other General Industrial Equipment	Diesel	88	Tier 4	---	0.000	0.000	0.177	0.000	0.000	0.000
Other Material Handling Equipment	Other Material Handling Equipment	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Pavers	Pavers	Diesel	130	Tier 4	---	0.000	0.000	0.000	0.000	0.154	0.000
Paving Equipment	Paving Equipment	Diesel	132	Tier 4	---	0.000	0.000	0.000	0.000	0.268	0.000
Plate Compactors	Plate Compactors	Diesel	25	Tier 4	---	0.000	0.333	0.127	0.273	0.121	0.000
Pressure Washers	Pressure Washers	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Pumps	Pumps	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Rollers	Rollers	Diesel	80	Tier 4	---	0.000	0.471	0.135	0.000	0.129	0.000
Rough Terrain Forklifts	Rollers	Diesel	80	Tier 4	---	0.135	0.471	0.360	2.340	0.000	0.000
Rubber Tired Dozers	Rubber Tired Dozers	Diesel	247	Tier 4	---	1.170	1.532	0.292	2.507	0.279	0.000
Rubber Tired Loaders	Rubber Tired Loaders	Diesel	203	Tier 4	---	0.433	2.266	0.108	0.000	0.000	0.000
Scrapers	Scrapers	Diesel	367	Tier 4	---	0.000	0.000	0.000	0.000	0.497	0.000
Signal Boards	Signal Boards	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Skid Steer Loaders	Skid Steer Loaders	Diesel	65	Tier 4	---	0.142	0.093	0.000	0.000	0.000	0.000
Surfacing Equipment	Surfacing Equipment	Diesel	263	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Sweepers/Scrubbers	Sweepers/Scrubbers	Diesel	64	Tier 4	---	0.000	0.000	0.000	0.000	0.000	0.000
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	97	Tier 4	---	0.637	1.391	0.637	4.144	0.101	0.000
Trenchers	Trenchers	Diesel	78	Tier 4	---	0.000	0.302	0.000	0.000	0.000	0.000
Welders	Welders	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Slant Pile Drill	Skid Steer Loaders	Diesel	65	Tier 4	---	0.000	0.373	0.000	0.000	0.000	0.000
Soil Mix Drill Rig	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.000	1.713	0.000	0.000	0.000	0.000
Grout Plant	Cement and Mortar Mixers	Diesel	25	Tier 4	---	0.000	0.217	0.000	0.000	0.000	0.000
Soldier Pile Rig	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.000	1.713	0.000	0.000	0.000	0.000
Tie Back Drill	Bore/Drill Rigs	Diesel	221	Tier 4	---	0.000	1.713	0.000	0.000	0.000	0.000
Air Compressor for Tie Back Rig	Air Compressors	Diesel	78	Tier 4	---	0.000	0.581	0.000	0.000	0.000	0.000
Concrete Truck	Off-Highway Trucks	Diesel	402	Tier 4	---	0.013	0.182	2.221	1.682	0.034	0.000
Concrete Boom Pump	Pumps	Diesel	84	Tier 4	---	0.092	0.482	0.736	5.382	0.088	0.000
Scissor Lift	Aerial Lifts	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Tower Crane	Cranes	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Hoist (Construction Elevator)	Aerial Lifts	Electric	0	---	---	0.000	0.000	0.000	0.000	0.000	0.000
Light Plant	Signal Boards	Diesel	25	Tier 4	---	0.364	0.954	0.364	0.000	0.116	0.000
Recycling Plant	Crushing/Proc. Equipment	Diesel	85	Tier 4	---	0.393	0.257	0.000	0.000	0.000	0.000
					Project Emissions (lbs/phase)	5.914	24.347	8.326	25.005	1.934	0.050
					Project Emissions (tons/phase)	0.003	0.012	0.004	0.013	0.001	0.000

Potrero Yard Modernization Project
Table G-2.6: Worker Trip Criteria Air Pollutant Emissions

Unmitigated Worker Trip NOx Emissions

Project Emissions	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Project Emissions (lbs/phase)	2.7	12.0	9.2	536.2	1.1	1.3
Project Emissions (tons/phase)	1.E-03	6.E-03	5.E-03	3.E-01	5.E-04	7.E-04

Potrero Yard Modernization Project
Table G-2.6: Worker Trip Criteria Air Pollutant Emissions

Unmitigated Worker Trip ROG Emissions

Project Emissions	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Project Emissions (lbs/phase)	0.71	3.1	2.37	138.88	0.28	0.34
Project Emissions (tons/phase)	4.E-04	2.E-03	1.E-03	7.E-02	1.E-04	2.E-04

Potrero Yard Modernization Project
Table G-2.6: Worker Trip Criteria Air Pollutant Emissions

Unmitigated Worker Trip PM10 Emissions

Project Emissions	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Project Emissions (lbs/phase)	0.11	0.48	0.37	21.63	0.04	0.05
Project Emissions (tons/phase)	6.E-05	2.E-04	2.E-04	1.E-02	2.E-05	3.E-05

Potrero Yard Modernization Project
Table G-2.6: Worker Trip Criteria Air Pollutant Emissions

Unmitigated Worker Trip PM2.5 Emissions

Project Emissions	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Project Emissions (lbs/phase)	0.10	0.45	0.34	19.89	0.04	0.05
Project Emissions (tons/phase)	5.E-05	2.E-04	2.E-04	1.E-02	2.E-05	2.E-05

Potrero Yard Modernization Project
Table G-2.7: Truck Trip Criteria Air Pollutant Emissions

Unmitigated Truck Trip NOx Emissions (pounds)

Truck Trip Activity	One-Way Distance (miles)	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Total Vendor TruckTrips	7.3	189	124	237	237	3076	14
Total Soil Haul Truck Trips	55	5401	21652	460	216	108	22
Total Concrete Truck Trips	20	9	122	685	1495	1132	23
Project Emissions (lbs/phase)		5599	21898	1382	1947	4317	58
Project Emissions (tons/phase)		2.8	10.9	0.7	1.0	2.2	0.0

Potrero Yard Modernization Project
Table G-2.7: Truck Trip Criteria Air Pollutant Emissions

Unmitigated Truck Trip ROG Emissions (pounds)

Truck Trip Activity	One-Way Distance (miles)	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Total Vendor TruckTrips	7.3	5.7	3.7	7.1	7.1	92.5	0.4
Total Soil Haul Truck Trips	55	71.7	287.5	6.1	2.9	1.4	0.3
Total Concrete Truck Trips	20	0.2	2.4	13.3	29.0	22.0	0.4
Project Emissions (lbs/phase)		78	294	27	39	116	1
Project Emissions (tons/phase)		0.04	0.15	0.01	0.02	0.06	0.00

Potrero Yard Modernization Project
Table G-2.7: Truck Trip Criteria Air Pollutant Emissions

Unmitigated Truck Trip PM10 Emissions (pounds)

Truck Trip Activity	One-Way Distance (miles)	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Total Vendor TruckTrips	7.3	0.7	0.5	0.9	0.9	11.9	0.1
Total Soil Haul Truck Trips	55	29.7	119.1	2.5	1.2	0.6	0.1
Total Concrete Truck Trips	20	0.0	0.6	3.4	7.3	5.6	0.1
Project Emissions (lbs/phase)		30	120	7	9	18	0
Project Emissions (tons/phase)		0.02	0.06	0.00	0.00	0.01	0.00

Potrero Yard Modernization Project
Table G-2.7: Truck Trip Criteria Air Pollutant Emissions

Unmitigated Truck Trip PM2.5 Emissions (pounds)

Truck Trip Activity	One-Way Distance (miles)	Demolition	Site Preparation, Grading, Piling	Foundation	Building Construction	Paving	Architectural Coating
Total Vendor TruckTrips	7.3	0.7	0.5	0.9	0.9	11.4	0.1
Total Soil Haul Truck Trips	55	28.4	114.0	2.4	1.1	0.6	0.1
Total Concrete Truck Trips	20	0.0	0.6	3.2	7.0	5.3	0.1
Project Emissions (lbs/phase)		29	115	7	9	17	0
Project Emissions (tons/phase)		0.01	0.06	0.00	0.00	0.01	0.00

Table G-2.8 : EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: SAN FRANCISCO
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN.
Note 'day' in the unit is operation day.

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	ROG_RUNEX	ROG_IDLEX	ROG_RESTLOSS	ROG_DIURN	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_PMTW	PM10_PMBW
SAN FRANCISCO	2023	LDA	Aggregated	Aggregated	GAS	161367.5	5500029.8	761671	0.0335	0.0000	0.0090	0.0000	0.1694	0.1682	0.0016	0.0000	0.0020	0.0158	0.0018	0.0000	0.0080	0.0368
SAN FRANCISCO	2023	LDT1	Aggregated	Aggregated	GAS	17686.5	532518.2	82418	0.0605	0.0000	0.0163	0.0000	0.2606	0.2683	0.0019	0.0000	0.0020	0.0158	0.0021	0.0000	0.0080	0.0368
SAN FRANCISCO	2023	LDT2	Aggregated	Aggregated	GAS	54830.8	1673679.2	257592	0.0561	0.0000	0.0133	0.0000	0.2455	0.2223	0.0016	0.0000	0.0020	0.0158	0.0018	0.0000	0.0080	0.0368
SAN FRANCISCO	2023	HHDT	Aggregated	Aggregated	DSL	1101.7	75402.7	7732	4.0681	42.9263	0.0360	2.5499	0.0000	0.0000	0.0231	0.0428	0.0087	0.0256	0.0241	0.0448	0.0348	0.0596

Potrero Yard Modernization Project
Table G-2.9: Off-Gassing Criteria Air Pollutant Emissions

Unmitigated Off-Gassing from Asphalt Paving

Land Use	Component	Square feet	Acre	Year of Asphalt Paving	VOC Emission Factor[1] (lb/acre)	Emissions (lb)
Industrial	Ramps and Circulation	463,000	10.63	2023	2.6	27.64
	Shared Basement Circulation	22,000	0.51	2023	2.6	1.31

Note:

[1] VOC emission factor consistent with the emission factor used in CalEEMod 2016.3.2. ROG and VOC can be used interchangeably for CEQA analysis.

Abbreviations:

CalEEMod = California Emissions Estimator Model

lb = pounds

ROG = reactive organic gases

VOC = volatile organic compounds

Reference:

California Air Pollution Control Officers Association (CAPCOA), 2016, CalEEMod User's Guide, Appendix A, Calculation Details for CalEEMod, October.

Potrero Yard Modernization Project
Table G-2.9: Off-Gassing Criteria Air Pollutant Emissions

Unmitigated Off-Gassing from Architectural Coatings

Land Use	Floor Area (SF)	Surface Area Factor	Total Surface Area (SF)	Interior Surface Area (SF)	Interior VOC Limit (g/L)	Exterior Surface Area (SF)	Exterior VOC Limit (g/L)	SF/L	L/gal	g/lb	Emissions (lb)
Nonresidential	756,000	2	1,512,000	1,134,000	100	378,000	150	180	3.785	454	7,878
Residential	544,000	2.7	1,468,800	1,101,600	100	367,200	150	180	3.785	454	7,653

Abbreviations:

VOC = volatile organic compounds

SF = square feet

lb = pounds

g/L = grams per liter

SF/L = square feet per liter

L/gal = liters per gallon

g/lb = grams per pound

Appendix G-3

Operation Criteria Air Pollutant Calculations and
Supporting Documentation

Overview: Includes two CalEEMod reports with unmitigated emission estimates of criteria air pollutants from energy use, area sources, and stationary sources for the existing land use and the proposed Potrero Yard Modernization Project. Also includes a third CalEEMod report with the mitigated emissions estimates of criteria air pollutants from the proposed emergency diesel generators. The CalEEMod reports also include estimates of total vehicle miles travelled, which were used to calculate criteria air pollutant emissions from on-road operational vehicles using the summarized EMFAC2017 emissions factors.

Potrero Yard Existing Conditions.v1

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	221.00	1000sqft	4.40	221,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Existing land use consistent with the project Notice of Preparation and Travel Demand study.

Construction Phase - No construction for existing conditions (default assumptions left in as a placeholder to run the model).

Vehicle Trips - Worker trip rates entered based on the Travel Demand report. CalEEMod used to calculated total vehicle miles travelled; however, then emissions were recalculated outside of CalEEMod using EMFAC2017.

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	5.07	4.40
tblVehicleTrips	ST_TR	1.32	5.23
tblVehicleTrips	SU_TR	0.68	5.23
tblVehicleTrips	WD_TR	6.97	5.23

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1603	1.5471	1.1926	2.4900e-003	0.1141	0.0752	0.1893	0.0499	0.0703	0.1202	0.0000	223.1586	223.1586	0.0457	0.0000	224.3004
2021	1.3313	1.6981	1.5771	3.4300e-003	0.0736	0.0771	0.1507	0.0200	0.0725	0.0925	0.0000	309.6531	309.6531	0.0562	0.0000	311.0574
Maximum	**1.3313**	**1.6981**	**1.5771**	**3.4300e-003**	**0.1141**	**0.0771**	**0.1893**	**0.0499**	**0.0725**	**0.1202**	**0.0000**	**309.6531**	**309.6531**	**0.0562**	**0.0000**	**311.0574**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1603	1.5471	1.1926	2.4900e-003	0.1141	0.0752	0.1893	0.0499	0.0703	0.1202	0.0000	223.1584	223.1584	0.0457	0.0000	224.3003
2021	1.3313	1.6981	1.5771	3.4300e-003	0.0736	0.0771	0.1507	0.0200	0.0725	0.0925	0.0000	309.6529	309.6529	0.0562	0.0000	311.0572
Maximum	**1.3313**	**1.6981**	**1.5771**	**3.4300e-003**	**0.1141**	**0.0771**	**0.1893**	**0.0499**	**0.0725**	**0.1202**	**0.0000**	**309.6529**	**309.6529**	**0.0562**	**0.0000**	**311.0572**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**7-22-2020**	**10-21-2020**	1.0284	1.0284
2	**10-22-2020**	**1-21-2021**	0.8513	0.8513
3	**1-22-2021**	**4-21-2021**	0.7719	0.7719
4	**4-22-2021**	**7-21-2021**	0.7775	0.7775
5	**7-22-2021**	**9-30-2021**	1.3347	1.3347
		Highest	1.3347	1.3347

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9786	2.0000e-005	2.0400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9500e-003	3.9500e-003	1.0000e-005	0.0000	4.2100e-003
Energy	0.0295	0.2681	0.2252	1.6100e-003		0.0204	0.0204		0.0204	0.0204	0.0000	777.9299	777.9299	0.0276	9.9000e-003	781.5689
Mobile	0.3713	1.5495	4.3532	0.0152	1.2631	0.0210	1.2841	0.3405	0.0198	0.3603	0.0000	1,397.8247	1,397.8247	0.0606	0.0000	1,399.3384
Waste						0.0000	0.0000		0.0000	0.0000	55.6276	0.0000	55.6276	3.2875	0.0000	137.8151
Water						0.0000	0.0000		0.0000	0.0000	16.2137	80.4475	96.6611	1.6689	0.0401	150.3265
Total	**1.3793**	**1.8177**	**4.5805**	**0.0169**	**1.2631**	**0.0414**	**1.3045**	**0.3405**	**0.0402**	**0.3806**	**71.8413**	**2,256.2061**	**2,328.0474**	**5.0446**	**0.0500**	**2,469.0532**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9786	2.0000e-005	2.0400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9500e-003	3.9500e-003	1.0000e-005	0.0000	4.2100e-003
Energy	0.0295	0.2681	0.2252	1.6100e-003		0.0204	0.0204		0.0204	0.0204	0.0000	777.9299	777.9299	0.0276	9.9000e-003	781.5689
Mobile	0.3713	1.5495	4.3532	0.0152	1.2631	0.0210	1.2841	0.3405	0.0198	0.3603	0.0000	1,397.8247	1,397.8247	0.0606	0.0000	1,399.3384
Waste						0.0000	0.0000		0.0000	0.0000	55.6276	0.0000	55.6276	3.2875	0.0000	137.8151
Water						0.0000	0.0000		0.0000	0.0000	16.2137	80.4475	96.6611	1.6689	0.0401	150.3265
Total	**1.3793**	**1.8177**	**4.5805**	**0.0169**	**1.2631**	**0.0414**	**1.3045**	**0.3405**	**0.0402**	**0.3806**	**71.8413**	**2,256.2061**	**2,328.0474**	**5.0446**	**0.0500**	**2,469.0532**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/22/2020	8/18/2020	5	20	
2	Site Preparation	Site Preparation	8/19/2020	8/25/2020	5	5	
3	Grading	Grading	8/26/2020	9/4/2020	5	8	
4	Building Construction	Building Construction	9/5/2020	7/23/2021	5	230	
5	Paving	Paving	7/24/2021	8/18/2021	5	18	
6	Architectural Coating	Architectural Coating	8/19/2021	9/13/2021	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 331,500; Non-Residential Outdoor: 110,500; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	93.00	36.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	19.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2386
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**		**0.0166**	**0.0166**		**0.0154**	**0.0154**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2386**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	3.0000e-004	3.3700e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.1265	1.1265	2.0000e-005	0.0000	1.1271
Total	**4.6000e-004**	**3.0000e-004**	**3.3700e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.1265**	**1.1265**	**2.0000e-005**	**0.0000**	**1.1271**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2385
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**		**0.0166**	**0.0166**		**0.0154**	**0.0154**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2385**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	3.0000e-004	3.3700e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.1265	1.1265	2.0000e-005	0.0000	1.1271
Total	**4.6000e-004**	**3.0000e-004**	**3.3700e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.1265**	**1.1265**	**2.0000e-005**	**0.0000**	**1.1271**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4253
Total	**0.0102**	**0.1060**	**0.0538**	**1.0000e-004**	**0.0452**	**5.4900e-003**	**0.0507**	**0.0248**	**5.0500e-003**	**0.0299**	**0.0000**	**8.3577**	**8.3577**	**2.7000e-003**	**0.0000**	**8.4253**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	9.0000e-005	1.0100e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3380	0.3380	1.0000e-005	0.0000	0.3381
Total	**1.4000e-004**	**9.0000e-005**	**1.0100e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3380**	**0.3380**	**1.0000e-005**	**0.0000**	**0.3381**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4252
Total	**0.0102**	**0.1060**	**0.0538**	**1.0000e-004**	**0.0452**	**5.4900e-003**	**0.0507**	**0.0248**	**5.0500e-003**	**0.0299**	**0.0000**	**8.3577**	**8.3577**	**2.7000e-003**	**0.0000**	**8.4252**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	9.0000e-005	1.0100e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3380	0.3380	1.0000e-005	0.0000	0.3381
Total	**1.4000e-004**	**9.0000e-005**	**1.0100e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3380**	**0.3380**	**1.0000e-005**	**0.0000**	**0.3381**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.1055	0.0642	1.2000e-004		5.0900e-003	5.0900e-003		4.6900e-003	4.6900e-003	0.0000	10.4235	10.4235	3.3700e-003	0.0000	10.5078
Total	**9.7200e-003**	**0.1055**	**0.0642**	**1.2000e-004**	**0.0262**	**5.0900e-003**	**0.0313**	**0.0135**	**4.6900e-003**	**0.0182**	**0.0000**	**10.4235**	**10.4235**	**3.3700e-003**	**0.0000**	**10.5078**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.2000e-004	1.3500e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4506	0.4506	1.0000e-005	0.0000	0.4508
Total	**1.8000e-004**	**1.2000e-004**	**1.3500e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4506**	**0.4506**	**1.0000e-005**	**0.0000**	**0.4508**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.1055	0.0642	1.2000e-004		5.0900e-003	5.0900e-003		4.6900e-003	4.6900e-003	0.0000	10.4235	10.4235	3.3700e-003	0.0000	10.5078
Total	**9.7200e-003**	**0.1055**	**0.0642**	**1.2000e-004**	**0.0262**	**5.0900e-003**	**0.0313**	**0.0135**	**4.6900e-003**	**0.0182**	**0.0000**	**10.4235**	**10.4235**	**3.3700e-003**	**0.0000**	**10.5078**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.2000e-004	1.3500e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4506	0.4506	1.0000e-005	0.0000	0.4508
Total	**1.8000e-004**	**1.2000e-004**	**1.3500e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4506**	**0.4506**	**1.0000e-005**	**0.0000**	**0.4508**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0890	0.8058	0.7076	1.1300e-003		0.0469	0.0469		0.0441	0.0441	0.0000	97.2762	97.2762	0.0237	0.0000	97.8695
Total	**0.0890**	**0.8058**	**0.7076**	**1.1300e-003**		**0.0469**	**0.0469**		**0.0441**	**0.0441**	**0.0000**	**97.2762**	**97.2762**	**0.0237**	**0.0000**	**97.8695**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5600e-003	0.1893	0.0559	4.1000e-004	9.8800e-003	8.4000e-004	0.0107	2.8600e-003	8.0000e-004	3.6600e-003	0.0000	41.8538	41.8538	5.5800e-003	0.0000	41.9934
Worker	0.0119	7.9000e-003	0.0878	3.2000e-004	0.0309	2.4000e-004	0.0311	8.2100e-003	2.2000e-004	8.4300e-003	0.0000	29.3339	29.3339	6.4000e-004	0.0000	29.3499
Total	**0.0174**	**0.1972**	**0.1437**	**7.3000e-004**	**0.0407**	**1.0800e-003**	**0.0418**	**0.0111**	**1.0200e-003**	**0.0121**	**0.0000**	**71.1876**	**71.1876**	**6.2200e-003**	**0.0000**	**71.3433**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0890	0.8058	0.7076	1.1300e-003		0.0469	0.0469		0.0441	0.0441	0.0000	97.2761	97.2761	0.0237	0.0000	97.8694
Total	**0.0890**	**0.8058**	**0.7076**	**1.1300e-003**		**0.0469**	**0.0469**		**0.0441**	**0.0441**	**0.0000**	**97.2761**	**97.2761**	**0.0237**	**0.0000**	**97.8694**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5600e-003	0.1893	0.0559	4.1000e-004	9.8800e-003	8.4000e-004	0.0107	2.8600e-003	8.0000e-004	3.6600e-003	0.0000	41.8538	41.8538	5.5800e-003	0.0000	41.9934
Worker	0.0119	7.9000e-003	0.0878	3.2000e-004	0.0309	2.4000e-004	0.0311	8.2100e-003	2.2000e-004	8.4300e-003	0.0000	29.3339	29.3339	6.4000e-004	0.0000	29.3499
Total	**0.0174**	**0.1972**	**0.1437**	**7.3000e-004**	**0.0407**	**1.0800e-003**	**0.0418**	**0.0111**	**1.0200e-003**	**0.0121**	**0.0000**	**71.1876**	**71.1876**	**6.2200e-003**	**0.0000**	**71.3433**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1388	1.2725	1.2100	1.9700e-003		0.0700	0.0700		0.0658	0.0658	0.0000	169.0952	169.0952	0.0408	0.0000	170.1151
Total	**0.1388**	**1.2725**	**1.2100**	**1.9700e-003**		**0.0700**	**0.0700**		**0.0658**	**0.0658**	**0.0000**	**169.0952**	**169.0952**	**0.0408**	**0.0000**	**170.1151**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0200e-003	0.3013	0.0920	7.0000e-004	0.0172	6.8000e-004	0.0179	4.9600e-003	6.5000e-004	5.6100e-003	0.0000	71.8205	71.8205	9.5300e-003	0.0000	72.0587
Worker	0.0193	0.0123	0.1411	5.4000e-004	0.0537	4.1000e-004	0.0541	0.0143	3.7000e-004	0.0146	0.0000	49.1641	49.1641	1.0100e-003	0.0000	49.1893
Total	**0.0273**	**0.3136**	**0.2331**	**1.2400e-003**	**0.0708**	**1.0900e-003**	**0.0719**	**0.0192**	**1.0200e-003**	**0.0203**	**0.0000**	**120.9846**	**120.9846**	**0.0105**	**0.0000**	**121.2480**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1388	1.2725	1.2100	1.9700e-003		0.0700	0.0700		0.0658	0.0658	0.0000	169.0950	169.0950	0.0408	0.0000	170.1149
Total	**0.1388**	**1.2725**	**1.2100**	**1.9700e-003**		**0.0700**	**0.0700**		**0.0658**	**0.0658**	**0.0000**	**169.0950**	**169.0950**	**0.0408**	**0.0000**	**170.1149**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0200e-003	0.3013	0.0920	7.0000e-004	0.0172	6.8000e-004	0.0179	4.9600e-003	6.5000e-004	5.6100e-003	0.0000	71.8205	71.8205	9.5300e-003	0.0000	72.0587
Worker	0.0193	0.0123	0.1411	5.4000e-004	0.0537	4.1000e-004	0.0541	0.0143	3.7000e-004	0.0146	0.0000	49.1641	49.1641	1.0100e-003	0.0000	49.1893
Total	**0.0273**	**0.3136**	**0.2331**	**1.2400e-003**	**0.0708**	**1.0900e-003**	**0.0719**	**0.0192**	**1.0200e-003**	**0.0203**	**0.0000**	**120.9846**	**120.9846**	**0.0105**	**0.0000**	**121.2480**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8500e-003	0.0976	0.1103	1.7000e-004		5.2100e-003	5.2100e-003		4.8100e-003	4.8100e-003	0.0000	14.7336	14.7336	4.6300e-003	0.0000	14.8493
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8500e-003**	**0.0976**	**0.1103**	**1.7000e-004**		**5.2100e-003**	**5.2100e-003**		**4.8100e-003**	**4.8100e-003**	**0.0000**	**14.7336**	**14.7336**	**4.6300e-003**	**0.0000**	**14.8493**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.3000e-004	3.7400e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3035	1.3035	3.0000e-005	0.0000	1.3042
Total	**5.1000e-004**	**3.3000e-004**	**3.7400e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.3035**	**1.3035**	**3.0000e-005**	**0.0000**	**1.3042**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8500e-003	0.0976	0.1103	1.7000e-004		5.2100e-003	5.2100e-003		4.8100e-003	4.8100e-003	0.0000	14.7335	14.7335	4.6300e-003	0.0000	14.8493
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8500e-003**	**0.0976**	**0.1103**	**1.7000e-004**		**5.2100e-003**	**5.2100e-003**		**4.8100e-003**	**4.8100e-003**	**0.0000**	**14.7335**	**14.7335**	**4.6300e-003**	**0.0000**	**14.8493**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	3.3000e-004	3.7400e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3035	1.3035	3.0000e-005	0.0000	1.3042
Total	**5.1000e-004**	**3.3000e-004**	**3.7400e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.3035**	**1.3035**	**3.0000e-005**	**0.0000**	**1.3042**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1524					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9700e-003	0.0137	0.0164	3.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	2.2979	2.2979	1.6000e-004	0.0000	2.3019
Total	**1.1544**	**0.0137**	**0.0164**	**3.0000e-005**		**8.5000e-004**	**8.5000e-004**		**8.5000e-004**	**8.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.6000e-004**	**0.0000**	**2.3019**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.1000e-004	3.5500e-003	1.0000e-005	1.3500e-003	1.0000e-005	1.3600e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2383	1.2383	3.0000e-005	0.0000	1.2390
Total	**4.9000e-004**	**3.1000e-004**	**3.5500e-003**	**1.0000e-005**	**1.3500e-003**	**1.0000e-005**	**1.3600e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2383**	**1.2383**	**3.0000e-005**	**0.0000**	**1.2390**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1524					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9700e-003	0.0137	0.0164	3.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	2.2979	2.2979	1.6000e-004	0.0000	2.3019
Total	**1.1544**	**0.0137**	**0.0164**	**3.0000e-005**		**8.5000e-004**	**8.5000e-004**		**8.5000e-004**	**8.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.6000e-004**	**0.0000**	**2.3019**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.1000e-004	3.5500e-003	1.0000e-005	1.3500e-003	1.0000e-005	1.3600e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2383	1.2383	3.0000e-005	0.0000	1.2390
Total	**4.9000e-004**	**3.1000e-004**	**3.5500e-003**	**1.0000e-005**	**1.3500e-003**	**1.0000e-005**	**1.3600e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2383**	**1.2383**	**3.0000e-005**	**0.0000**	**1.2390**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3713	1.5495	4.3532	0.0152	1.2631	0.0210	1.2841	0.3405	0.0198	0.3603	0.0000	1,397.8247	1,397.8247	0.0606	0.0000	1,399.3384
Unmitigated	0.3713	1.5495	4.3532	0.0152	1.2631	0.0210	1.2841	0.3405	0.0198	0.3603	0.0000	1,397.8247	1,397.8247	0.0606	0.0000	1,399.3384

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	1,155.83	1,155.83	1155.83	3,374,459	3,374,459
Total	1,155.83	1,155.83	1,155.83	3,374,459	3,374,459

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.607015	0.041018	0.191033	0.087570	0.015386	0.004865	0.027149	0.008727	0.004280	0.004624	0.006947	0.000926	0.000460

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	486.0432	486.0432	0.0220	4.5500e-003	487.9477
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	486.0432	486.0432	0.0220	4.5500e-003	487.9477
NaturalGas Mitigated	0.0295	0.2681	0.2252	1.6100e-003		0.0204	0.0204		0.0204	0.0204	0.0000	291.8867	291.8867	5.5900e-003	5.3500e-003	293.6212
NaturalGas Unmitigated	0.0295	0.2681	0.2252	1.6100e-003		0.0204	0.0204		0.0204	0.0204	0.0000	291.8867	291.8867	5.5900e-003	5.3500e-003	293.6212

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	5.46975e+006	0.0295	0.2681	0.2252	1.6100e-003		0.0204	0.0204		0.0204	0.0204	0.0000	291.8867	291.8867	5.5900e-003	5.3500e-003	293.6212
Total		**0.0295**	**0.2681**	**0.2252**	**1.6100e-003**		**0.0204**	**0.0204**		**0.0204**	**0.0204**	**0.0000**	**291.8867**	**291.8867**	**5.5900e-003**	**5.3500e-003**	**293.6212**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	5.46975e+006	0.0295	0.2681	0.2252	1.6100e-003		0.0204	0.0204		0.0204	0.0204	0.0000	291.8867	291.8867	5.5900e-003	5.3500e-003	293.6212
Total		**0.0295**	**0.2681**	**0.2252**	**1.6100e-003**		**0.0204**	**0.0204**		**0.0204**	**0.0204**	**0.0000**	**291.8867**	**291.8867**	**5.5900e-003**	**5.3500e-003**	**293.6212**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.67076e+006	486.0432	0.0220	4.5500e-003	487.9477
Total		**486.0432**	**0.0220**	**4.5500e-003**	**487.9477**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.67076e+006	486.0432	0.0220	4.5500e-003	487.9477
Total		**486.0432**	**0.0220**	**4.5500e-003**	**487.9477**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9786	2.0000e-005	2.0400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9500e-003	3.9500e-003	1.0000e-005	0.0000	4.2100e-003
Unmitigated	0.9786	2.0000e-005	2.0400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9500e-003	3.9500e-003	1.0000e-005	0.0000	4.2100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1152					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8631					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9000e-004	2.0000e-005	2.0400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9500e-003	3.9500e-003	1.0000e-005	0.0000	4.2100e-003
Total	**0.9786**	**2.0000e-005**	**2.0400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.9500e-003**	**3.9500e-003**	**1.0000e-005**	**0.0000**	**4.2100e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1152					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8631					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9000e-004	2.0000e-005	2.0400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9500e-003	3.9500e-003	1.0000e-005	0.0000	4.2100e-003
Total	**0.9786**	**2.0000e-005**	**2.0400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.9500e-003**	**3.9500e-003**	**1.0000e-005**	**0.0000**	**4.2100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	96.6611	1.6689	0.0401	150.3265
Unmitigated	96.6611	1.6689	0.0401	150.3265

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	51.1063 / 0	96.6611	1.6689	0.0401	150.3265
Total		**96.6611**	**1.6689**	**0.0401**	**150.3265**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	51.1063 / 0	96.6611	1.6689	0.0401	150.3265
Total		**96.6611**	**1.6689**	**0.0401**	**150.3265**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	55.6276	3.2875	0.0000	137.8151
Unmitigated	55.6276	3.2875	0.0000	137.8151

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	274.04	55.6276	3.2875	0.0000	137.8151
Total		**55.6276**	**3.2875**	**0.0000**	**137.8151**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	274.04	55.6276	3.2875	0.0000	137.8151
Total		**55.6276**	**3.2875**	**0.0000**	**137.8151**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Potrero Yard Operational.v1

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	52.00	1000sqft	0.00	52,000.00	0
General Light Industry	576.00	1000sqft	0.00	576,000.00	0
High Turnover (Sit Down Restaurant)	33.00	1000sqft	0.00	33,000.00	0
Apartments High Rise	575.00	Dwelling Unit	4.40	544,000.00	1645

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2026
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Land uses are consistent with the project Notice of Preparation and Travel Demand study.

Construction Phase - Construction emissions calculated outside of CalEEMod. The default assumptions used as a placeholder to be able to run the model.

Vehicle Trips - Trip rates based on Travel Demand report. Office trips included in Light Industry and Restaurant trips included in Residential. CalEEMod used to calculate total VMT, then emissions were recalculated outside of CalEEMod using EMFAC2017.

Woodstoves - Assume no woodstove or fireplaces.

Stationary Sources - Emergency Generators and Fire Pumps - The proposed project would include up to three new diesel backup generators with a maximum power of 1,000 kilowatts.

Potrero Yard Operational.v1 - San Francisco County, Annual

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Exterior	367,200.00	266.00
tblArchitecturalCoating	ConstArea_Residential_Interior	1,101,600.00	798.00
tblAreaCoating	Area_Residential_Exterior	367200	266
tblAreaCoating	Area_Residential_Interior	1101600	798
tblFireplaces	NumberGas	86.25	0.00
tblFireplaces	NumberNoFireplace	23.00	0.00
tblFireplaces	NumberWood	97.75	0.00
tblLandUse	LandUseSquareFeet	575,000.00	544,000.00
tblLandUse	LotAcreage	1.19	0.00
tblLandUse	LotAcreage	13.22	0.00
tblLandUse	LotAcreage	0.76	0.00
tblLandUse	LotAcreage	9.27	4.40
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,341.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	3.00
tblVehicleTrips	ST_TR	4.98	4.35
tblVehicleTrips	ST_TR	1.32	3.18
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	158.37	0.00
tblVehicleTrips	SU_TR	3.65	3.19
tblVehicleTrips	SU_TR	0.68	3.18
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	131.84	0.00
tblVehicleTrips	WD_TR	4.20	3.67
tblVehicleTrips	WD_TR	6.97	3.18

tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	127.15	0.00
tblWoodstoves	NumberCatalytic	11.50	0.00
tblWoodstoves	NumberNoncatalytic	11.50	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.4485	3.7637	4.1120	0.0140	0.7984	0.1008	0.8992	0.2346	0.0946	0.3291	0.0000	1,318.4817	1,318.4817	0.1521	0.0000	1,322.2834
2024	3.4765	0.2045	0.2837	7.7000e-004	0.0373	6.9100e-003	0.0442	0.0100	6.4700e-003	0.0165	0.0000	70.7881	70.7881	9.7900e-003	0.0000	71.0328
Maximum	**3.4765**	**3.7637**	**4.1120**	**0.0140**	**0.7984**	**0.1008**	**0.8992**	**0.2346**	**0.0946**	**0.3291**	**0.0000**	**1,318.4817**	**1,318.4817**	**0.1521**	**0.0000**	**1,322.2834**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.4485	3.7637	4.1120	0.0140	0.7984	0.1008	0.8992	0.2346	0.0946	0.3291	0.0000	1,318.4813	1,318.4813	0.1521	0.0000	1,322.2830
2024	3.4765	0.2045	0.2837	7.7000e-004	0.0373	6.9100e-003	0.0442	0.0100	6.4700e-003	0.0165	0.0000	70.7880	70.7880	9.7900e-003	0.0000	71.0327
Maximum	**3.4765**	**3.7637**	**4.1120**	**0.0140**	**0.7984**	**0.1008**	**0.8992**	**0.2346**	**0.0946**	**0.3291**	**0.0000**	**1,318.4813**	**1,318.4813**	**0.1521**	**0.0000**	**1,322.2830**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-9-2023	4-8-2023	0.9369	0.9369
2	4-9-2023	7-8-2023	1.1088	1.1088
3	7-9-2023	10-8-2023	1.1225	1.1225
4	10-9-2023	1-8-2024	1.1345	1.1345
5	1-9-2024	4-8-2024	3.4115	3.4115
		Highest	3.4115	3.4115

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Energy	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	3,818.0090	3,818.0090	0.1367	0.0481	3,835.7584
Mobile	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682
Stationary	0.1651	0.7381	0.4208	7.9000e-004		0.0243	0.0243		0.0243	0.0243	0.0000	76.5974	76.5974	0.0107	0.0000	76.8658
Waste						0.0000	0.0000		0.0000	0.0000	288.2066	0.0000	288.2066	17.0325	0.0000	714.0196
Water						0.0000	0.0000		0.0000	0.0000	60.2536	329.4274	389.6810	6.2035	0.1492	589.2332
Total	**6.3003**	**5.3650**	**15.0764**	**0.0471**	**3.8324**	**0.1836**	**4.0160**	**1.0317**	**0.1809**	**1.2126**	**348.4602**	**7,781.8074**	**8,130.2676**	**23.5335**	**0.1973**	**8,777.3988**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Energy	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	3,818.0090	3,818.0090	0.1367	0.0481	3,835.7584
Mobile	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682
Stationary	0.1651	0.7381	0.4208	7.9000e-004		0.0243	0.0243		0.0243	0.0243	0.0000	76.5974	76.5974	0.0107	0.0000	76.8658
Waste						0.0000	0.0000		0.0000	0.0000	288.2066	0.0000	288.2066	17.0325	0.0000	714.0196
Water						0.0000	0.0000		0.0000	0.0000	60.2536	329.4274	389.6810	6.2035	0.1492	589.2332
Total	**6.3003**	**5.3650**	**15.0764**	**0.0471**	**3.8324**	**0.1836**	**4.0160**	**1.0317**	**0.1809**	**1.2126**	**348.4602**	**7,781.8074**	**8,130.2676**	**23.5335**	**0.1973**	**8,777.3988**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/9/2023	2/3/2023	5	20	
2	Site Preparation	Site Preparation	2/4/2023	2/10/2023	5	5	
3	Grading	Grading	2/11/2023	2/22/2023	5	8	
4	Building Construction	Building Construction	2/23/2023	1/10/2024	5	230	
5	Paving	Paving	1/11/2024	2/5/2024	5	18	
6	Architectural Coating	Architectural Coating	2/6/2024	2/29/2024	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 798; Residential Outdoor: 266; Non-Residential Indoor: 991,500; Non-Residential Outdoor: 330,500; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	686.00	170.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	137.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0227	0.2148	0.1964	3.9000e-004		9.9800e-003	9.9800e-003		9.2800e-003	9.2800e-003	0.0000	33.9921	33.9921	9.5200e-003	0.0000	34.2301
Total	**0.0227**	**0.2148**	**0.1964**	**3.9000e-004**		**9.9800e-003**	**9.9800e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**33.9921**	**33.9921**	**9.5200e-003**	**0.0000**	**34.2301**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.2000e-004	2.7100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0055	1.0055	2.0000e-005	0.0000	1.0060
Total	**3.8000e-004**	**2.2000e-004**	**2.7100e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0055**	**1.0055**	**2.0000e-005**	**0.0000**	**1.0060**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0227	0.2148	0.1964	3.9000e-004		9.9800e-003	9.9800e-003		9.2800e-003	9.2800e-003	0.0000	33.9920	33.9920	9.5200e-003	0.0000	34.2300
Total	**0.0227**	**0.2148**	**0.1964**	**3.9000e-004**		**9.9800e-003**	**9.9800e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**33.9920**	**33.9920**	**9.5200e-003**	**0.0000**	**34.2300**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.2000e-004	2.7100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0055	1.0055	2.0000e-005	0.0000	1.0060
Total	**3.8000e-004**	**2.2000e-004**	**2.7100e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0055**	**1.0055**	**2.0000e-005**	**0.0000**	**1.0060**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0688	0.0456	1.0000e-004		3.1700e-003	3.1700e-003		2.9100e-003	2.9100e-003	0.0000	8.3627	8.3627	2.7000e-003	0.0000	8.4303
Total	**6.6500e-003**	**0.0688**	**0.0456**	**1.0000e-004**	**0.0452**	**3.1700e-003**	**0.0483**	**0.0248**	**2.9100e-003**	**0.0277**	**0.0000**	**8.3627**	**8.3627**	**2.7000e-003**	**0.0000**	**8.4303**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	8.1000e-004	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3017	0.3017	1.0000e-005	0.0000	0.3018
Total	**1.1000e-004**	**7.0000e-005**	**8.1000e-004**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3017**	**0.3017**	**1.0000e-005**	**0.0000**	**0.3018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0688	0.0456	1.0000e-004		3.1700e-003	3.1700e-003		2.9100e-003	2.9100e-003	0.0000	8.3627	8.3627	2.7000e-003	0.0000	8.4303
Total	**6.6500e-003**	**0.0688**	**0.0456**	**1.0000e-004**	**0.0452**	**3.1700e-003**	**0.0483**	**0.0248**	**2.9100e-003**	**0.0277**	**0.0000**	**8.3627**	**8.3627**	**2.7000e-003**	**0.0000**	**8.4303**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	8.1000e-004	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3017	0.3017	1.0000e-005	0.0000	0.3018
Total	**1.1000e-004**	**7.0000e-005**	**8.1000e-004**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3017**	**0.3017**	**1.0000e-005**	**0.0000**	**0.3018**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8400e-003	0.0717	0.0590	1.2000e-004		3.1000e-003	3.1000e-003		2.8500e-003	2.8500e-003	0.0000	10.4243	10.4243	3.3700e-003	0.0000	10.5085
Total	**6.8400e-003**	**0.0717**	**0.0590**	**1.2000e-004**	**0.0262**	**3.1000e-003**	**0.0293**	**0.0135**	**2.8500e-003**	**0.0163**	**0.0000**	**10.4243**	**10.4243**	**3.3700e-003**	**0.0000**	**10.5085**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	9.0000e-005	1.0900e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4022	0.4022	1.0000e-005	0.0000	0.4024
Total	**1.5000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4022**	**0.4022**	**1.0000e-005**	**0.0000**	**0.4024**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8400e-003	0.0717	0.0590	1.2000e-004		3.1000e-003	3.1000e-003		2.8500e-003	2.8500e-003	0.0000	10.4242	10.4242	3.3700e-003	0.0000	10.5085
Total	**6.8400e-003**	**0.0717**	**0.0590**	**1.2000e-004**	**0.0262**	**3.1000e-003**	**0.0293**	**0.0135**	**2.8500e-003**	**0.0163**	**0.0000**	**10.4242**	**10.4242**	**3.3700e-003**	**0.0000**	**10.5085**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	9.0000e-005	1.0900e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4022	0.4022	1.0000e-005	0.0000	0.4024
Total	**1.5000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4022**	**0.4022**	**1.0000e-005**	**0.0000**	**0.4024**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1746	1.5967	1.8031	2.9900e-003		0.0777	0.0777		0.0731	0.0731	0.0000	257.3033	257.3033	0.0612	0.0000	258.8335
Total	**0.1746**	**1.5967**	**1.8031**	**2.9900e-003**		**0.0777**	**0.0777**		**0.0731**	**0.0731**	**0.0000**	**257.3033**	**257.3033**	**0.0612**	**0.0000**	**258.8335**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0435	1.6979	0.6255	4.7900e-003	0.1233	2.4400e-003	0.1258	0.0357	2.3300e-003	0.0380	0.0000	496.2426	496.2426	0.0660	0.0000	497.8916
Worker	0.1935	0.1134	1.3777	5.6400e-003	0.6017	4.4300e-003	0.6061	0.1601	4.0800e-003	0.1641	0.0000	510.4475	510.4475	9.2700e-003	0.0000	510.6793
Total	**0.2371**	**1.8113**	**2.0032**	**0.0104**	**0.7250**	**6.8700e-003**	**0.7319**	**0.1957**	**6.4100e-003**	**0.2021**	**0.0000**	**1,006.6900**	**1,006.6900**	**0.0752**	**0.0000**	**1,008.5708**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1746	1.5967	1.8031	2.9900e-003		0.0777	0.0777		0.0731	0.0731	0.0000	257.3030	257.3030	0.0612	0.0000	258.8332
Total	**0.1746**	**1.5967**	**1.8031**	**2.9900e-003**		**0.0777**	**0.0777**		**0.0731**	**0.0731**	**0.0000**	**257.3030**	**257.3030**	**0.0612**	**0.0000**	**258.8332**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0435	1.6979	0.6255	4.7900e-003	0.1233	2.4400e-003	0.1258	0.0357	2.3300e-003	0.0380	0.0000	496.2426	496.2426	0.0660	0.0000	497.8916
Worker	0.1935	0.1134	1.3777	5.6400e-003	0.6017	4.4300e-003	0.6061	0.1601	4.0800e-003	0.1641	0.0000	510.4475	510.4475	9.2700e-003	0.0000	510.6793
Total	**0.2371**	**1.8113**	**2.0032**	**0.0104**	**0.7250**	**6.8700e-003**	**0.7319**	**0.1957**	**6.4100e-003**	**0.2021**	**0.0000**	**1,006.6900**	**1,006.6900**	**0.0752**	**0.0000**	**1,008.5708**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.8900e-003	0.0538	0.0647	1.1000e-004		2.4500e-003	2.4500e-003		2.3100e-003	2.3100e-003	0.0000	9.2740	9.2740	2.1900e-003	0.0000	9.3288
Total	**5.8900e-003**	**0.0538**	**0.0647**	**1.1000e-004**		**2.4500e-003**	**2.4500e-003**		**2.3100e-003**	**2.3100e-003**	**0.0000**	**9.2740**	**9.2740**	**2.1900e-003**	**0.0000**	**9.3288**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5000e-003	0.0597	0.0223	1.7000e-004	4.4400e-003	8.0000e-005	4.5300e-003	1.2800e-003	8.0000e-005	1.3700e-003	0.0000	17.7167	17.7167	2.3700e-003	0.0000	17.7761
Worker	6.6300e-003	3.7200e-003	0.0465	2.0000e-004	0.0217	1.6000e-004	0.0218	5.7700e-003	1.5000e-004	5.9100e-003	0.0000	17.6622	17.6622	3.0000e-004	0.0000	17.6698
Total	**8.1300e-003**	**0.0634**	**0.0688**	**3.7000e-004**	**0.0261**	**2.4000e-004**	**0.0264**	**7.0500e-003**	**2.3000e-004**	**7.2800e-003**	**0.0000**	**35.3789**	**35.3789**	**2.6700e-003**	**0.0000**	**35.4458**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.8900e-003	0.0538	0.0647	1.1000e-004		2.4500e-003	2.4500e-003		2.3100e-003	2.3100e-003	0.0000	9.2740	9.2740	2.1900e-003	0.0000	9.3288
Total	**5.8900e-003**	**0.0538**	**0.0647**	**1.1000e-004**		**2.4500e-003**	**2.4500e-003**		**2.3100e-003**	**2.3100e-003**	**0.0000**	**9.2740**	**9.2740**	**2.1900e-003**	**0.0000**	**9.3288**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5000e-003	0.0597	0.0223	1.7000e-004	4.4400e-003	8.0000e-005	4.5300e-003	1.2800e-003	8.0000e-005	1.3700e-003	0.0000	17.7167	17.7167	2.3700e-003	0.0000	17.7761
Worker	6.6300e-003	3.7200e-003	0.0465	2.0000e-004	0.0217	1.6000e-004	0.0218	5.7700e-003	1.5000e-004	5.9100e-003	0.0000	17.6622	17.6622	3.0000e-004	0.0000	17.6698
Total	**8.1300e-003**	**0.0634**	**0.0688**	**3.7000e-004**	**0.0261**	**2.4000e-004**	**0.0264**	**7.0500e-003**	**2.3000e-004**	**7.2800e-003**	**0.0000**	**35.3789**	**35.3789**	**2.6700e-003**	**0.0000**	**35.4458**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.0745	0.1100	1.7000e-004		3.5900e-003	3.5900e-003		3.3200e-003	3.3200e-003	0.0000	14.7423	14.7423	4.6300e-003	0.0000	14.8581
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.9300e-003**	**0.0745**	**0.1100**	**1.7000e-004**		**3.5900e-003**	**3.5900e-003**		**3.3200e-003**	**3.3200e-003**	**0.0000**	**14.7423**	**14.7423**	**4.6300e-003**	**0.0000**	**14.8581**

3.6 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1586	1.1586	2.0000e-005	0.0000	1.1591
Total	**4.3000e-004**	**2.4000e-004**	**3.0500e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1586**	**1.1586**	**2.0000e-005**	**0.0000**	**1.1591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.0745	0.1100	1.7000e-004		3.5900e-003	3.5900e-003		3.3200e-003	3.3200e-003	0.0000	14.7423	14.7423	4.6300e-003	0.0000	14.8581
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.9300e-003**	**0.0745**	**0.1100**	**1.7000e-004**		**3.5900e-003**	**3.5900e-003**		**3.3200e-003**	**3.3200e-003**	**0.0000**	**14.7423**	**14.7423**	**4.6300e-003**	**0.0000**	**14.8581**

3.6 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1586	1.1586	2.0000e-005	0.0000	1.1591
Total	**4.3000e-004**	**2.4000e-004**	**3.0500e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1586**	**1.1586**	**2.0000e-005**	**0.0000**	**1.1591**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.4495					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6300e-003	0.0110	0.0163	3.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	2.2979	2.2979	1.3000e-004	0.0000	2.3012
Total	**3.4511**	**0.0110**	**0.0163**	**3.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.3000e-004**	**0.0000**	**2.3012**

3.7 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9800e-003	1.6700e-003	0.0209	9.0000e-005	9.7400e-003	7.0000e-005	9.8100e-003	2.5900e-003	7.0000e-005	2.6600e-003	0.0000	7.9364	7.9364	1.4000e-004	0.0000	7.9398
Total	**2.9800e-003**	**1.6700e-003**	**0.0209**	**9.0000e-005**	**9.7400e-003**	**7.0000e-005**	**9.8100e-003**	**2.5900e-003**	**7.0000e-005**	**2.6600e-003**	**0.0000**	**7.9364**	**7.9364**	**1.4000e-004**	**0.0000**	**7.9398**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.4495					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6300e-003	0.0110	0.0163	3.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	2.2979	2.2979	1.3000e-004	0.0000	2.3012
Total	**3.4511**	**0.0110**	**0.0163**	**3.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.3000e-004**	**0.0000**	**2.3012**

3.7 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9800e-003	1.6700e-003	0.0209	9.0000e-005	9.7400e-003	7.0000e-005	9.8100e-003	2.5900e-003	7.0000e-005	2.6600e-003	0.0000	7.9364	7.9364	1.4000e-004	0.0000	7.9398
Total	**2.9800e-003**	**1.6700e-003**	**0.0209**	**9.0000e-005**	**9.7400e-003**	**7.0000e-005**	**9.8100e-003**	**2.5900e-003**	**7.0000e-005**	**2.6600e-003**	**0.0000**	**7.9364**	**7.9364**	**1.4000e-004**	**0.0000**	**7.9398**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682
Unmitigated	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	2,110.25	2,501.25	1834.25	4,911,792	4,911,792
General Light Industry	1,831.68	1,831.68	1831.68	5,347,610	5,347,610
General Office Building	0.00	0.00	0.00		
High Turnover (Sit Down Restaurant)	0.00	0.00	0.00		
Total	3,941.93	4,332.93	3,665.93	10,259,403	10,259,403

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549
General Light Industry	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549
General Office Building	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549
High Turnover (Sit Down Restaurant)	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,440.0212	2,440.0212	0.1103	0.0228	2,449.5819
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,440.0212	2,440.0212	0.1103	0.0228	2,449.5819
NaturalGas Mitigated	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	1,377.9879	1,377.9879	0.0264	0.0253	1,386.1766
NaturalGas Unmitigated	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	1,377.9879	1,377.9879	0.0264	0.0253	1,386.1766

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	5.02e+006	0.0271	0.2313	0.0984	1.4800e-003		0.0187	0.0187		0.0187	0.0187	0.0000	267.8862	267.8862	5.1300e-003	4.9100e-003	269.4781
General Light Industry	1.4256e+007	0.0769	0.6988	0.5870	4.1900e-003		0.0531	0.0531		0.0531	0.0531	0.0000	760.7545	760.7545	0.0146	0.0140	765.2752
General Office Building	1.00516e+006	5.4200e-003	0.0493	0.0414	3.0000e-004		3.7400e-003	3.7400e-003		3.7400e-003	3.7400e-003	0.0000	53.6392	53.6392	1.0300e-003	9.8000e-004	53.9579
High Turnover (Sit Down Restaurant)	5.54136e+006	0.0299	0.2716	0.2282	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.7081	295.7081	5.6700e-003	5.4200e-003	297.4653
Total		**0.1392**	**1.2510**	**0.9550**	**7.6000e-003**		**0.0962**	**0.0962**		**0.0962**	**0.0962**	**0.0000**	**1,377.9879**	**1,377.9879**	**0.0264**	**0.0253**	**1,386.1766**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	5.02e+006	0.0271	0.2313	0.0984	1.4800e-003		0.0187	0.0187		0.0187	0.0187	0.0000	267.8862	267.8862	5.1300e-003	4.9100e-003	269.4781
General Light Industry	1.4256e+007	0.0769	0.6988	0.5870	4.1900e-003		0.0531	0.0531		0.0531	0.0531	0.0000	760.7545	760.7545	0.0146	0.0140	765.2752
General Office Building	1.00516e+006	5.4200e-003	0.0493	0.0414	3.0000e-004		3.7400e-003	3.7400e-003		3.7400e-003	3.7400e-003	0.0000	53.6392	53.6392	1.0300e-003	9.8000e-004	53.9579
High Turnover (Sit Down Restaurant)	5.54136e+006	0.0299	0.2716	0.2282	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.7081	295.7081	5.6700e-003	5.4200e-003	297.4653
Total		**0.1392**	**1.2510**	**0.9550**	**7.6000e-003**		**0.0962**	**0.0962**		**0.0962**	**0.0962**	**0.0000**	**1,377.9879**	**1,377.9879**	**0.0264**	**0.0253**	**1,386.1766**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	2.42764e+006	706.2296	0.0319	6.6100e-003	708.9968
General Light Industry	4.35456e+006	1,266.7914	0.0573	0.0119	1,271.7551
General Office Building	648960	188.7899	8.5400e-003	1.7700e-003	189.5296
High Turnover (Sit Down Restaurant)	956340	278.2103	0.0126	2.6000e-003	279.3004
Total		**2,440.0212**	**0.1103**	**0.0228**	**2,449.5819**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	2.42764e+006	706.2296	0.0319	6.6100e-003	708.9968
General Light Industry	4.35456e+006	1,266.7914	0.0573	0.0119	1,271.7551
General Office Building	648960	188.7899	8.5400e-003	1.7700e-003	189.5296
High Turnover (Sit Down Restaurant)	956340	278.2103	0.0126	2.6000e-003	279.3004
Total		**2,440.0212**	**0.1103**	**0.0228**	**2,449.5819**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Unmitigated	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3450					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1286	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Total	**5.1797**	**0.0492**	**4.2715**	**2.3000e-004**		**0.0237**	**0.0237**		**0.0237**	**0.0237**	**0.0000**	**6.9859**	**6.9859**	**6.7100e-003**	**0.0000**	**7.1536**

6.2 Area by SubCategory

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.3450					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1286	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Total	**5.1797**	**0.0492**	**4.2715**	**2.3000e-004**		**0.0237**	**0.0237**		**0.0237**	**0.0237**	**0.0000**	**6.9859**	**6.9859**	**6.7100e-003**	**0.0000**	**7.1536**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	389.6810	6.2035	0.1492	589.2332
Unmitigated	389.6810	6.2035	0.1492	589.2332

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	37.4636 / 23.6183	94.9056	1.2245	0.0296	134.3394
General Light Industry	133.2 / 0	251.9313	4.3498	0.1045	391.8013
General Office Building	9.24215 / 5.66455	23.2480	0.3021	7.3000e-003	32.9755
High Turnover (Sit Down Restaurant)	10.0166 / 0.639358	19.5962	0.3271	7.8600e-003	30.1169
Total		**389.6810**	**6.2035**	**0.1492**	**589.2331**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	37.4636 / 23.6183	94.9056	1.2245	0.0296	134.3394
General Light Industry	133.2 / 0	251.9313	4.3498	0.1045	391.8013
General Office Building	9.24215 / 5.66455	23.2480	0.3021	7.3000e-003	32.9755
High Turnover (Sit Down Restaurant)	10.0166 / 0.639358	19.5962	0.3271	7.8600e-003	30.1169
Total		**389.6810**	**6.2035**	**0.1492**	**589.2331**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	288.2066	17.0325	0.0000	714.0196
Unmitigated	288.2066	17.0325	0.0000	714.0196

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	264.5	53.6911	3.1731	0.0000	133.0175
General Light Industry	714.24	144.9843	8.5683	0.0000	359.1924
General Office Building	48.36	9.8166	0.5802	0.0000	24.3203
High Turnover (Sit Down Restaurant)	392.7	79.7146	4.7110	0.0000	197.4894
Total		**288.2066**	**17.0325**	**0.0000**	**714.0196**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	264.5	53.6911	3.1731	0.0000	133.0175
General Light Industry	714.24	144.9843	8.5683	0.0000	359.1924
General Office Building	48.36	9.8166	0.5802	0.0000	24.3203
High Turnover (Sit Down Restaurant)	392.7	79.7146	4.7110	0.0000	197.4894
Total		**288.2066**	**17.0325**	**0.0000**	**714.0196**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	3	1	50	1341	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.1651	0.7381	0.4208	7.9000e-004		0.0243	0.0243		0.0243	0.0243	0.0000	76.5974	76.5974	0.0107	0.0000	76.8658
Total	**0.1651**	**0.7381**	**0.4208**	**7.9000e-004**		**0.0243**	**0.0243**		**0.0243**	**0.0243**	**0.0000**	**76.5974**	**76.5974**	**0.0107**	**0.0000**	**76.8658**

11.0 Vegetation

Potrero Yard Operational.v1 (Tier 4 Diesel Generators)

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	52.00	1000sqft	0.00	52,000.00	0
General Light Industry	576.00	1000sqft	0.00	576,000.00	0
High Turnover (Sit Down Restaurant)	33.00	1000sqft	0.00	33,000.00	0
Apartments High Rise	575.00	Dwelling Unit	4.40	544,000.00	1645

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2026
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Potrero Yard Operational.v1 (Tier 4 Diesel Generators) - San Francisco County, Annual

Project Characteristics -

Land Use - Land uses are consistent with the project Notice of Preparation and Travel Demand study.

Construction Phase - Construction emissions calculated outside of CalEEMod. The default assumptions used as a placeholder to be able to run the model.

Vehicle Trips - Trip rates based on Travel Demand report. Office trips included in Light Industry and Restaurant trips included in Residential. CalEEMod used to calculate total VMT, then emissions were recalculated outside of CalEEMod using EMFAC2017.

Woodstoves - Assume no woodstove or fireplaces.

Stationary Sources - Emergency Generators and Fire Pumps - The proposed project would include up to three new diesel backup generators with a maximum power of 1,000 kilowatts.

Stationary Sources - Emergency Generators and Fire Pumps EF - Mitigation Measure: EPA Tier 4 Final PM emission standard for emergency generators.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Exterior	367,200.00	266.00
tblArchitecturalCoating	ConstArea_Residential_Interior	1,101,600.00	798.00
tblAreaCoating	Area_Residential_Exterior	367200	266
tblAreaCoating	Area_Residential_Interior	1101600	798
tblFireplaces	NumberGas	86.25	0.00
tblFireplaces	NumberNoFireplace	23.00	0.00
tblFireplaces	NumberWood	97.75	0.00
tblLandUse	LandUseSquareFeet	575,000.00	544,000.00
tblLandUse	LotAcreage	1.19	0.00
tblLandUse	LotAcreage	13.22	0.00
tblLandUse	LotAcreage	0.76	0.00
tblLandUse	LotAcreage	9.27	4.40
tblStationaryGeneratorsPumpsEF	PM10_EF	0.15	0.02
tblStationaryGeneratorsPumpsEF	PM2_5_EF	0.15	0.02
tblVehicleTrips	ST_TR	4.98	4.35
tblVehicleTrips	ST_TR	1.32	3.18
tblVehicleTrips	ST_TR	2.46	0.00

tblVehicleTrips	ST_TR	158.37	0.00
tblVehicleTrips	SU_TR	3.65	3.19
tblVehicleTrips	SU_TR	0.68	3.18
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	131.84	0.00
tblVehicleTrips	WD_TR	4.20	3.67
tblVehicleTrips	WD_TR	6.97	3.18
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	127.15	0.00
tblWoodstoves	NumberCatalytic	11.50	0.00
tblWoodstoves	NumberNoncatalytic	11.50	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.4485	3.7637	4.1120	0.0140	0.7984	0.1008	0.8992	0.2346	0.0946	0.3291	0.0000	1,318.4817	1,318.4817	0.1521	0.0000	1,322.2834
2024	3.4765	0.2045	0.2837	7.7000e-004	0.0373	6.9100e-003	0.0442	0.0100	6.4700e-003	0.0165	0.0000	70.7881	70.7881	9.7900e-003	0.0000	71.0328
Maximum	**3.4765**	**3.7637**	**4.1120**	**0.0140**	**0.7984**	**0.1008**	**0.8992**	**0.2346**	**0.0946**	**0.3291**	**0.0000**	**1,318.4817**	**1,318.4817**	**0.1521**	**0.0000**	**1,322.2834**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.4485	3.7637	4.1120	0.0140	0.7984	0.1008	0.8992	0.2346	0.0946	0.3291	0.0000	1,318.4813	1,318.4813	0.1521	0.0000	1,322.2830
2024	3.4765	0.2045	0.2837	7.7000e-004	0.0373	6.9100e-003	0.0442	0.0100	6.4700e-003	0.0165	0.0000	70.7880	70.7880	9.7900e-003	0.0000	71.0327
Maximum	**3.4765**	**3.7637**	**4.1120**	**0.0140**	**0.7984**	**0.1008**	**0.8992**	**0.2346**	**0.0946**	**0.3291**	**0.0000**	**1,318.4813**	**1,318.4813**	**0.1521**	**0.0000**	**1,322.2830**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-9-2023	4-8-2023	0.9369	0.9369
2	4-9-2023	7-8-2023	1.1088	1.1088
3	7-9-2023	10-8-2023	1.1225	1.1225
4	10-9-2023	1-8-2024	1.1345	1.1345
5	1-9-2024	4-8-2024	3.4115	3.4115
		Highest	3.4115	3.4115

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Energy	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	3,818.0090	3,818.0090	0.1367	0.0481	3,835.7584
Mobile	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682
Stationary	0.1651	0.7381	0.4208	7.9000e-004		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	76.5974	76.5974	0.0107	0.0000	76.8658
Waste						0.0000	0.0000		0.0000	0.0000	288.2066	0.0000	288.2066	17.0325	0.0000	714.0196
Water						0.0000	0.0000		0.0000	0.0000	60.2536	329.4274	389.6810	6.2035	0.1492	589.2332
Total	**6.3003**	**5.3650**	**15.0764**	**0.0471**	**3.8324**	**0.1629**	**3.9953**	**1.0317**	**0.1603**	**1.1920**	**348.4602**	**7,781.8074**	**8,130.2676**	**23.5335**	**0.1973**	**8,777.3988**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Energy	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	3,818.0090	3,818.0090	0.1367	0.0481	3,835.7584
Mobile	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682
Stationary	0.1651	0.7381	0.4208	7.9000e-004		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	76.5974	76.5974	0.0107	0.0000	76.8658
Waste						0.0000	0.0000		0.0000	0.0000	288.2066	0.0000	288.2066	17.0325	0.0000	714.0196
Water						0.0000	0.0000		0.0000	0.0000	60.2536	329.4274	389.6810	6.2035	0.1492	589.2332
Total	**6.3003**	**5.3650**	**15.0764**	**0.0471**	**3.8324**	**0.1629**	**3.9953**	**1.0317**	**0.1603**	**1.1920**	**348.4602**	**7,781.8074**	**8,130.2676**	**23.5335**	**0.1973**	**8,777.3988**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/9/2023	2/3/2023	5	20	
2	Site Preparation	Site Preparation	2/4/2023	2/10/2023	5	5	
3	Grading	Grading	2/11/2023	2/22/2023	5	8	
4	Building Construction	Building Construction	2/23/2023	1/10/2024	5	230	
5	Paving	Paving	1/11/2024	2/5/2024	5	18	
6	Architectural Coating	Architectural Coating	2/6/2024	2/29/2024	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 798; Residential Outdoor: 266; Non-Residential Indoor: 991,500; Non-Residential Outdoor: 330,500; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	686.00	170.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	137.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0227	0.2148	0.1964	3.9000e-004		9.9800e-003	9.9800e-003		9.2800e-003	9.2800e-003	0.0000	33.9921	33.9921	9.5200e-003	0.0000	34.2301
Total	**0.0227**	**0.2148**	**0.1964**	**3.9000e-004**		**9.9800e-003**	**9.9800e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**33.9921**	**33.9921**	**9.5200e-003**	**0.0000**	**34.2301**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.2000e-004	2.7100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0055	1.0055	2.0000e-005	0.0000	1.0060
Total	**3.8000e-004**	**2.2000e-004**	**2.7100e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0055**	**1.0055**	**2.0000e-005**	**0.0000**	**1.0060**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0227	0.2148	0.1964	3.9000e-004		9.9800e-003	9.9800e-003		9.2800e-003	9.2800e-003	0.0000	33.9920	33.9920	9.5200e-003	0.0000	34.2300
Total	**0.0227**	**0.2148**	**0.1964**	**3.9000e-004**		**9.9800e-003**	**9.9800e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**33.9920**	**33.9920**	**9.5200e-003**	**0.0000**	**34.2300**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.2000e-004	2.7100e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0055	1.0055	2.0000e-005	0.0000	1.0060
Total	**3.8000e-004**	**2.2000e-004**	**2.7100e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0055**	**1.0055**	**2.0000e-005**	**0.0000**	**1.0060**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0688	0.0456	1.0000e-004		3.1700e-003	3.1700e-003		2.9100e-003	2.9100e-003	0.0000	8.3627	8.3627	2.7000e-003	0.0000	8.4303
Total	**6.6500e-003**	**0.0688**	**0.0456**	**1.0000e-004**	**0.0452**	**3.1700e-003**	**0.0483**	**0.0248**	**2.9100e-003**	**0.0277**	**0.0000**	**8.3627**	**8.3627**	**2.7000e-003**	**0.0000**	**8.4303**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	8.1000e-004	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3017	0.3017	1.0000e-005	0.0000	0.3018
Total	**1.1000e-004**	**7.0000e-005**	**8.1000e-004**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3017**	**0.3017**	**1.0000e-005**	**0.0000**	**0.3018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0688	0.0456	1.0000e-004		3.1700e-003	3.1700e-003		2.9100e-003	2.9100e-003	0.0000	8.3627	8.3627	2.7000e-003	0.0000	8.4303
Total	**6.6500e-003**	**0.0688**	**0.0456**	**1.0000e-004**	**0.0452**	**3.1700e-003**	**0.0483**	**0.0248**	**2.9100e-003**	**0.0277**	**0.0000**	**8.3627**	**8.3627**	**2.7000e-003**	**0.0000**	**8.4303**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	8.1000e-004	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3017	0.3017	1.0000e-005	0.0000	0.3018
Total	**1.1000e-004**	**7.0000e-005**	**8.1000e-004**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3017**	**0.3017**	**1.0000e-005**	**0.0000**	**0.3018**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8400e-003	0.0717	0.0590	1.2000e-004		3.1000e-003	3.1000e-003		2.8500e-003	2.8500e-003	0.0000	10.4243	10.4243	3.3700e-003	0.0000	10.5085
Total	**6.8400e-003**	**0.0717**	**0.0590**	**1.2000e-004**	**0.0262**	**3.1000e-003**	**0.0293**	**0.0135**	**2.8500e-003**	**0.0163**	**0.0000**	**10.4243**	**10.4243**	**3.3700e-003**	**0.0000**	**10.5085**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	9.0000e-005	1.0900e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4022	0.4022	1.0000e-005	0.0000	0.4024
Total	**1.5000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4022**	**0.4022**	**1.0000e-005**	**0.0000**	**0.4024**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8400e-003	0.0717	0.0590	1.2000e-004		3.1000e-003	3.1000e-003		2.8500e-003	2.8500e-003	0.0000	10.4242	10.4242	3.3700e-003	0.0000	10.5085
Total	**6.8400e-003**	**0.0717**	**0.0590**	**1.2000e-004**	**0.0262**	**3.1000e-003**	**0.0293**	**0.0135**	**2.8500e-003**	**0.0163**	**0.0000**	**10.4242**	**10.4242**	**3.3700e-003**	**0.0000**	**10.5085**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	9.0000e-005	1.0900e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4022	0.4022	1.0000e-005	0.0000	0.4024
Total	**1.5000e-004**	**9.0000e-005**	**1.0900e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4022**	**0.4022**	**1.0000e-005**	**0.0000**	**0.4024**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1746	1.5967	1.8031	2.9900e-003		0.0777	0.0777		0.0731	0.0731	0.0000	257.3033	257.3033	0.0612	0.0000	258.8335
Total	**0.1746**	**1.5967**	**1.8031**	**2.9900e-003**		**0.0777**	**0.0777**		**0.0731**	**0.0731**	**0.0000**	**257.3033**	**257.3033**	**0.0612**	**0.0000**	**258.8335**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0435	1.6979	0.6255	4.7900e-003	0.1233	2.4400e-003	0.1258	0.0357	2.3300e-003	0.0380	0.0000	496.2426	496.2426	0.0660	0.0000	497.8916
Worker	0.1935	0.1134	1.3777	5.6400e-003	0.6017	4.4300e-003	0.6061	0.1601	4.0800e-003	0.1641	0.0000	510.4475	510.4475	9.2700e-003	0.0000	510.6793
Total	**0.2371**	**1.8113**	**2.0032**	**0.0104**	**0.7250**	**6.8700e-003**	**0.7319**	**0.1957**	**6.4100e-003**	**0.2021**	**0.0000**	**1,006.6900**	**1,006.6900**	**0.0752**	**0.0000**	**1,008.5708**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1746	1.5967	1.8031	2.9900e-003		0.0777	0.0777		0.0731	0.0731	0.0000	257.3030	257.3030	0.0612	0.0000	258.8332
Total	**0.1746**	**1.5967**	**1.8031**	**2.9900e-003**		**0.0777**	**0.0777**		**0.0731**	**0.0731**	**0.0000**	**257.3030**	**257.3030**	**0.0612**	**0.0000**	**258.8332**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0435	1.6979	0.6255	4.7900e-003	0.1233	2.4400e-003	0.1258	0.0357	2.3300e-003	0.0380	0.0000	496.2426	496.2426	0.0660	0.0000	497.8916
Worker	0.1935	0.1134	1.3777	5.6400e-003	0.6017	4.4300e-003	0.6061	0.1601	4.0800e-003	0.1641	0.0000	510.4475	510.4475	9.2700e-003	0.0000	510.6793
Total	**0.2371**	**1.8113**	**2.0032**	**0.0104**	**0.7250**	**6.8700e-003**	**0.7319**	**0.1957**	**6.4100e-003**	**0.2021**	**0.0000**	**1,006.6900**	**1,006.6900**	**0.0752**	**0.0000**	**1,008.5708**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.8900e-003	0.0538	0.0647	1.1000e-004		2.4500e-003	2.4500e-003		2.3100e-003	2.3100e-003	0.0000	9.2740	9.2740	2.1900e-003	0.0000	9.3288
Total	**5.8900e-003**	**0.0538**	**0.0647**	**1.1000e-004**		**2.4500e-003**	**2.4500e-003**		**2.3100e-003**	**2.3100e-003**	**0.0000**	**9.2740**	**9.2740**	**2.1900e-003**	**0.0000**	**9.3288**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5000e-003	0.0597	0.0223	1.7000e-004	4.4400e-003	8.0000e-005	4.5300e-003	1.2800e-003	8.0000e-005	1.3700e-003	0.0000	17.7167	17.7167	2.3700e-003	0.0000	17.7761
Worker	6.6300e-003	3.7200e-003	0.0465	2.0000e-004	0.0217	1.6000e-004	0.0218	5.7700e-003	1.5000e-004	5.9100e-003	0.0000	17.6622	17.6622	3.0000e-004	0.0000	17.6698
Total	**8.1300e-003**	**0.0634**	**0.0688**	**3.7000e-004**	**0.0261**	**2.4000e-004**	**0.0264**	**7.0500e-003**	**2.3000e-004**	**7.2800e-003**	**0.0000**	**35.3789**	**35.3789**	**2.6700e-003**	**0.0000**	**35.4458**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.8900e-003	0.0538	0.0647	1.1000e-004		2.4500e-003	2.4500e-003		2.3100e-003	2.3100e-003	0.0000	9.2740	9.2740	2.1900e-003	0.0000	9.3288
Total	**5.8900e-003**	**0.0538**	**0.0647**	**1.1000e-004**		**2.4500e-003**	**2.4500e-003**		**2.3100e-003**	**2.3100e-003**	**0.0000**	**9.2740**	**9.2740**	**2.1900e-003**	**0.0000**	**9.3288**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5000e-003	0.0597	0.0223	1.7000e-004	4.4400e-003	8.0000e-005	4.5300e-003	1.2800e-003	8.0000e-005	1.3700e-003	0.0000	17.7167	17.7167	2.3700e-003	0.0000	17.7761
Worker	6.6300e-003	3.7200e-003	0.0465	2.0000e-004	0.0217	1.6000e-004	0.0218	5.7700e-003	1.5000e-004	5.9100e-003	0.0000	17.6622	17.6622	3.0000e-004	0.0000	17.6698
Total	**8.1300e-003**	**0.0634**	**0.0688**	**3.7000e-004**	**0.0261**	**2.4000e-004**	**0.0264**	**7.0500e-003**	**2.3000e-004**	**7.2800e-003**	**0.0000**	**35.3789**	**35.3789**	**2.6700e-003**	**0.0000**	**35.4458**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.0745	0.1100	1.7000e-004		3.5900e-003	3.5900e-003		3.3200e-003	3.3200e-003	0.0000	14.7423	14.7423	4.6300e-003	0.0000	14.8581
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.9300e-003**	**0.0745**	**0.1100**	**1.7000e-004**		**3.5900e-003**	**3.5900e-003**		**3.3200e-003**	**3.3200e-003**	**0.0000**	**14.7423**	**14.7423**	**4.6300e-003**	**0.0000**	**14.8581**

3.6 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1586	1.1586	2.0000e-005	0.0000	1.1591
Total	**4.3000e-004**	**2.4000e-004**	**3.0500e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1586**	**1.1586**	**2.0000e-005**	**0.0000**	**1.1591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.0745	0.1100	1.7000e-004		3.5900e-003	3.5900e-003		3.3200e-003	3.3200e-003	0.0000	14.7423	14.7423	4.6300e-003	0.0000	14.8581
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.9300e-003**	**0.0745**	**0.1100**	**1.7000e-004**		**3.5900e-003**	**3.5900e-003**		**3.3200e-003**	**3.3200e-003**	**0.0000**	**14.7423**	**14.7423**	**4.6300e-003**	**0.0000**	**14.8581**

3.6 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1586	1.1586	2.0000e-005	0.0000	1.1591
Total	**4.3000e-004**	**2.4000e-004**	**3.0500e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1586**	**1.1586**	**2.0000e-005**	**0.0000**	**1.1591**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.4495					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6300e-003	0.0110	0.0163	3.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	2.2979	2.2979	1.3000e-004	0.0000	2.3012
Total	**3.4511**	**0.0110**	**0.0163**	**3.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.3000e-004**	**0.0000**	**2.3012**

3.7 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9800e-003	1.6700e-003	0.0209	9.0000e-005	9.7400e-003	7.0000e-005	9.8100e-003	2.5900e-003	7.0000e-005	2.6600e-003	0.0000	7.9364	7.9364	1.4000e-004	0.0000	7.9398
Total	**2.9800e-003**	**1.6700e-003**	**0.0209**	**9.0000e-005**	**9.7400e-003**	**7.0000e-005**	**9.8100e-003**	**2.5900e-003**	**7.0000e-005**	**2.6600e-003**	**0.0000**	**7.9364**	**7.9364**	**1.4000e-004**	**0.0000**	**7.9398**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.4495					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6300e-003	0.0110	0.0163	3.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	2.2979	2.2979	1.3000e-004	0.0000	2.3012
Total	**3.4511**	**0.0110**	**0.0163**	**3.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.3000e-004**	**0.0000**	**2.3012**

3.7 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9800e-003	1.6700e-003	0.0209	9.0000e-005	9.7400e-003	7.0000e-005	9.8100e-003	2.5900e-003	7.0000e-005	2.6600e-003	0.0000	7.9364	7.9364	1.4000e-004	0.0000	7.9398
Total	**2.9800e-003**	**1.6700e-003**	**0.0209**	**9.0000e-005**	**9.7400e-003**	**7.0000e-005**	**9.8100e-003**	**2.5900e-003**	**7.0000e-005**	**2.6600e-003**	**0.0000**	**7.9364**	**7.9364**	**1.4000e-004**	**0.0000**	**7.9398**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682
Unmitigated	0.8163	3.3267	9.4291	0.0385	3.8324	0.0394	3.8718	1.0317	0.0368	1.0685	0.0000	3,550.7877	3,550.7877	0.1432	0.0000	3,554.3682

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	2,110.25	2,501.25	1834.25	4,911,792	4,911,792
General Light Industry	1,831.68	1,831.68	1831.68	5,347,610	5,347,610
General Office Building	0.00	0.00	0.00		
High Turnover (Sit Down Restaurant)	0.00	0.00	0.00		
Total	3,941.93	4,332.93	3,665.93	10,259,403	10,259,403

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549
General Light Industry	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549
General Office Building	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549
High Turnover (Sit Down Restaurant)	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,440.0212	2,440.0212	0.1103	0.0228	2,449.5819
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,440.0212	2,440.0212	0.1103	0.0228	2,449.5819
NaturalGas Mitigated	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	1,377.9879	1,377.9879	0.0264	0.0253	1,386.1766
NaturalGas Unmitigated	0.1392	1.2510	0.9550	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	1,377.9879	1,377.9879	0.0264	0.0253	1,386.1766

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	5.02e+006	0.0271	0.2313	0.0984	1.4800e-003		0.0187	0.0187		0.0187	0.0187	0.0000	267.8862	267.8862	5.1300e-003	4.9100e-003	269.4781
General Light Industry	1.4256e+007	0.0769	0.6988	0.5870	4.1900e-003		0.0531	0.0531		0.0531	0.0531	0.0000	760.7545	760.7545	0.0146	0.0140	765.2752
General Office Building	1.00516e+006	5.4200e-003	0.0493	0.0414	3.0000e-004		3.7400e-003	3.7400e-003		3.7400e-003	3.7400e-003	0.0000	53.6392	53.6392	1.0300e-003	9.8000e-004	53.9579
High Turnover (Sit Down Restaurant)	5.54136e+006	0.0299	0.2716	0.2282	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.7081	295.7081	5.6700e-003	5.4200e-003	297.4653
Total		**0.1392**	**1.2510**	**0.9550**	**7.6000e-003**		**0.0962**	**0.0962**		**0.0962**	**0.0962**	**0.0000**	**1,377.9879**	**1,377.9879**	**0.0264**	**0.0253**	**1,386.1766**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	5.02e+006	0.0271	0.2313	0.0984	1.4800e-003		0.0187	0.0187		0.0187	0.0187	0.0000	267.8862	267.8862	5.1300e-003	4.9100e-003	269.4781
General Light Industry	1.4256e+007	0.0769	0.6988	0.5870	4.1900e-003		0.0531	0.0531		0.0531	0.0531	0.0000	760.7545	760.7545	0.0146	0.0140	765.2752
General Office Building	1.00516e+006	5.4200e-003	0.0493	0.0414	3.0000e-004		3.7400e-003	3.7400e-003		3.7400e-003	3.7400e-003	0.0000	53.6392	53.6392	1.0300e-003	9.8000e-004	53.9579
High Turnover (Sit Down Restaurant)	5.54136e+006	0.0299	0.2716	0.2282	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.7081	295.7081	5.6700e-003	5.4200e-003	297.4653
Total		**0.1392**	**1.2510**	**0.9550**	**7.6000e-003**		**0.0962**	**0.0962**		**0.0962**	**0.0962**	**0.0000**	**1,377.9879**	**1,377.9879**	**0.0264**	**0.0253**	**1,386.1766**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	2.42764e+006	706.2296	0.0319	6.6100e-003	708.9968
General Light Industry	4.35456e+006	1,266.7914	0.0573	0.0119	1,271.7551
General Office Building	648960	188.7899	8.5400e-003	1.7700e-003	189.5296
High Turnover (Sit Down Restaurant)	956340	278.2103	0.0126	2.6000e-003	279.3004
Total		**2,440.0212**	**0.1103**	**0.0228**	**2,449.5819**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	2.42764e+006	706.2296	0.0319	6.6100e-003	708.9968
General Light Industry	4.35456e+006	1,266.7914	0.0573	0.0119	1,271.7551
General Office Building	648960	188.7899	8.5400e-003	1.7700e-003	189.5296
High Turnover (Sit Down Restaurant)	956340	278.2103	0.0126	2.6000e-003	279.3004
Total		**2,440.0212**	**0.1103**	**0.0228**	**2,449.5819**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Unmitigated	5.1797	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3450					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1286	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Total	**5.1797**	**0.0492**	**4.2715**	**2.3000e-004**		**0.0237**	**0.0237**		**0.0237**	**0.0237**	**0.0000**	**6.9859**	**6.9859**	**6.7100e-003**	**0.0000**	**7.1536**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3450					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.7061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1286	0.0492	4.2715	2.3000e-004		0.0237	0.0237		0.0237	0.0237	0.0000	6.9859	6.9859	6.7100e-003	0.0000	7.1536
Total	**5.1797**	**0.0492**	**4.2715**	**2.3000e-004**		**0.0237**	**0.0237**		**0.0237**	**0.0237**	**0.0000**	**6.9859**	**6.9859**	**6.7100e-003**	**0.0000**	**7.1536**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	389.6810	6.2035	0.1492	589.2332
Unmitigated	389.6810	6.2035	0.1492	589.2332

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	37.4636 / 23.6183	94.9056	1.2245	0.0296	134.3394
General Light Industry	133.2 / 0	251.9313	4.3498	0.1045	391.8013
General Office Building	9.24215 / 5.66455	23.2480	0.3021	7.3000e-003	32.9755
High Turnover (Sit Down Restaurant)	10.0166 / 0.639358	19.5962	0.3271	7.8600e-003	30.1169
Total		**389.6810**	**6.2035**	**0.1492**	**589.2331**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	37.4636 / 23.6183	94.9056	1.2245	0.0296	134.3394
General Light Industry	133.2 / 0	251.9313	4.3498	0.1045	391.8013
General Office Building	9.24215 / 5.66455	23.2480	0.3021	7.3000e-003	32.9755
High Turnover (Sit Down Restaurant)	10.0166 / 0.639358	19.5962	0.3271	7.8600e-003	30.1169
Total		**389.6810**	**6.2035**	**0.1492**	**589.2331**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	288.2066	17.0325	0.0000	714.0196
Unmitigated	288.2066	17.0325	0.0000	714.0196

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	264.5	53.6911	3.1731	0.0000	133.0175
General Light Industry	714.24	144.9843	8.5683	0.0000	359.1924
General Office Building	48.36	9.8166	0.5802	0.0000	24.3203
High Turnover (Sit Down Restaurant)	392.7	79.7146	4.7110	0.0000	197.4894
Total		**288.2066**	**17.0325**	**0.0000**	**714.0196**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	264.5	53.6911	3.1731	0.0000	133.0175
General Light Industry	714.24	144.9843	8.5683	0.0000	359.1924
General Office Building	48.36	9.8166	0.5802	0.0000	24.3203
High Turnover (Sit Down Restaurant)	392.7	79.7146	4.7110	0.0000	197.4894
Total		**288.2066**	**17.0325**	**0.0000**	**714.0196**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	3	1	50	1341	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.1651	0.7381	0.4208	7.9000e-004		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	76.5974	76.5974	0.0107	0.0000	76.8658
Total	**0.1651**	**0.7381**	**0.4208**	**7.9000e-004**		**3.6200e-003**	**3.6200e-003**		**3.6200e-003**	**3.6200e-003**	**0.0000**	**76.5974**	**76.5974**	**0.0107**	**0.0000**	**76.8658**

11.0 Vegetation

Potrero Yard Modernization Project
On-Road Criteria Air Pollutant Emissions

Unmitigated On-Road Criteria Air pollutant Emissions

Summart of Input Paramters

Scenario	Land Use	Annual VMT[1]	Daily VMT	Daily Trips	Fleet Mix	
					LDA	MHD
Existing	General Light Industry	3,374,459	9,245	1,156	95%	5%
Project	General Light Industry	5,347,610	14,651	2,109	95%	5%
Project	Apartments High Rise	4,911,792	13,457	1,833	95%	5%

Notes: VMT = vehicle miles travelled; LDA = light-duty autmobile; MHD = medium-heavy-duty truck

[1] Annual VMT estimated using CalEEMod.

Running Exhaust Emissions (pounds/day)

Scenario	Land Use	NOx	PM2.5	PM10	ROG
Existing	General Light Industry	4.24	0.12	0.13	0.49
Project	General Light Industry	3.24	0.06	0.06	0.21
Project	Apartments High Rise	2.98	0.05	0.05	0.19

Idling Emissions (pounds/day)

Scenario	Land Use	NOx	PM2.5	PM10	ROG
Existing	General Light Industry	1.55	0.00	0.00	0.02
Project	General Light Industry	1.70	0.00	0.00	0.02
Project	Apartments High Rise	1.48	0.00	0.00	0.02

Tire Wear Emissions (pounds/day)

Scenario	Land Use	NOx	PM2.5	PM10	ROG
Existing	General Light Industry	0.00	0.04	0.17	0.00
Project	General Light Industry	0.00	0.07	0.26	0.00
Project	Apartments High Rise	0.00	0.06	0.24	0.00

Brake Wear Emissions (pounds/day)

Scenario	Land Use	NOx	PM2.5	PM10	ROG
Existing	General Light Industry	0.00	0.36	0.84	0.00
Project	General Light Industry	0.00	0.57	1.34	0.00
Project	Apartments High Rise	0.00	0.53	1.23	0.00

Resuspended Dust Emissions (pounds/day)

Scenario	Land Use	NOx	PM2.5	PM10	ROG
Existing	General Light Industry		0.48	3.21	
Project	General Light Industry		0.63	4.22	
Project	Apartments High Rise		0.58	3.88	

Total Emissions (pounds/day)

Scenario	Land Use	NOx	PM2.5	PM10	ROG
Existing	General Light Industry	5.79	1.01	4.36	0.51
Project	General Light Industry	3.24	1.33	5.88	0.23
Project	Apartments High Rise	4.45	1.22	5.40	0.21

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: SAN FRANCISCO
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN. Note 'day' in the unit is operat

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_PMTW	PM10_PMBW	ROG_RUNEX	ROG_IDLEX
SAN FRANCISCO	2020	LDA	Aggregated	Aggregated	GAS	154153	5467924	725649	0.049	0.000	0.002	0.000	0.002	0.016	0.002	0.000	0.008	0.037	0.014	0.000
SAN FRANCISCO	2020	MHDT	Aggregated	Aggregated	DSL	3806	200119	34169	3.238	12.160	0.084	0.031	0.003	0.056	0.088	0.033	0.012	0.130	0.212	0.160

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: SAN FRANCISCO
Calendar Year: 2026
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN. Note 'day' in the unit is operation day.

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_PMTW	PM10_PMBW	ROG_RUNEX	ROG_IDLEX
SAN FRANCISCO	2026	LDA	Aggregated	Aggregated	GAS	168431	5512785	795306	0.026	0.000	0.001	0.000	0.002	0.016	0.002	0.000	0.008	0.037	0.006	0.000
SAN FRANCISCO	2026	MHDT	Aggregated	Aggregated	DSL	5101	274129	44892	1.521	7.313	0.007	0.005	0.003	0.056	0.007	0.005	0.012	0.130	0.011	0.103

Appendix G-4

Air Dispersion Modeling and Health Risk Assessment Calculations
and Supporting Documentation

Overview: Includes AERMOD source input summary files; unit-emission contouring results at the Maximally Exposed Individual Resident (MEIR); local on-road emission rate calculations during construction and operation; and unit-emission conversion factors for each source of air pollution. Supporting documentation also includes as summary of traffic volumes estimated on roadway segments by Fehr and Peers for light-duty vehicles, trucks, and buses, as well as EMFAC2017 emissions factors used to calculate on-road vehicle emissions.

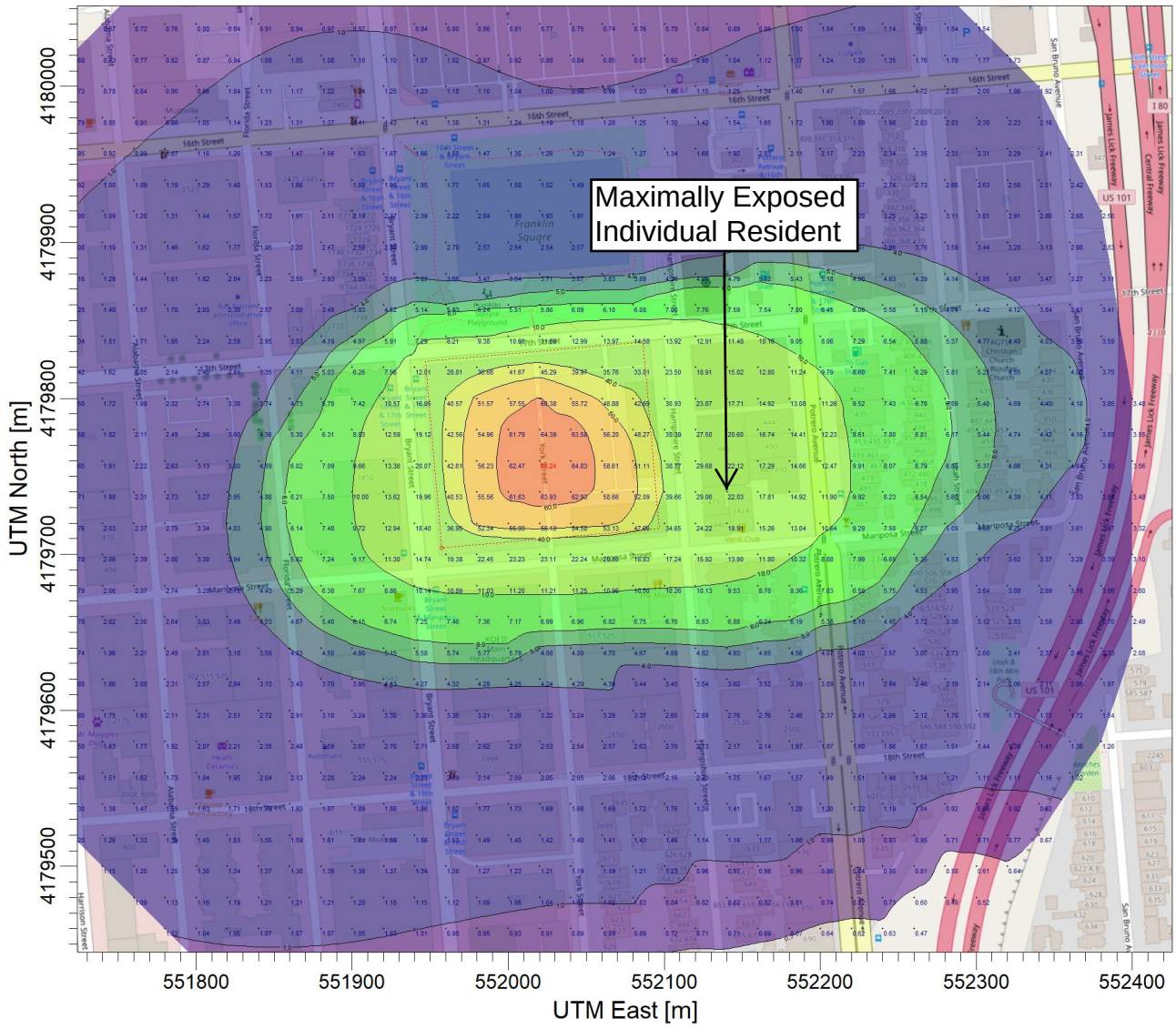
Source Pathway - Source Inputs

Diesel Off-Road Construction Equipment: Area Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/ (s-m^2)]	Length of X Side [m]	Length of Y Side [m]	Orientation Angle from North [deg]	Initial Vertical Dim. [m]
AREA	AREA1	551957.23	4179704.27	14.75	5.00	0.00006	140.00	120.00	-5.00	1.40

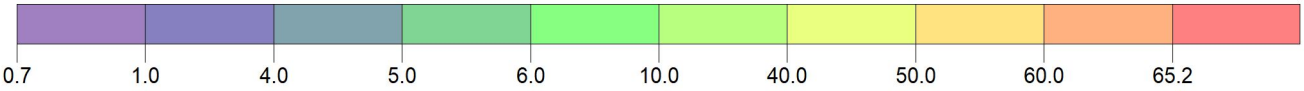
PROJECT TITLE:

Potrero Yard Modernization Project
Off-Road Construction Equipment Unit Emission Rate Results



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 65.2 [ug/m^3] at (552020.00, 4179760.00)



COMMENTS:	SOURCES: **1**		
	RECEPTORS: **1190**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:4,414 0 0.1 km	
	MAX: **65.2 ug/m^3**		PROJECT NO.:

Source Pathway - Source Inputs

Source Pathway - Source Inputs

On-Road Construction Truck Trips: Volume Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	VOL1	551932.03	4179828.88	18.80	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL2	551945.16	4179829.89	18.84	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL3	551972.28	4179832.28	19.95	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL4	551959.14	4179831.26	19.36	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL5	551987.33	4179833.60	20.34	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL6	552000.47	4179834.61	21.23	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL7	552027.58	4179837.00	21.92	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL8	552014.44	4179835.99	21.64	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL9	552041.03	4179837.72	22.88	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL10	552054.17	4179838.73	22.98	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL11	552081.28	4179841.11	23.10	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL12	552068.14	4179840.10	23.09	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL13	552096.33	4179842.44	22.94	2.00	1.00000	5.16		1.20	2.30

Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	VOL14	551943.91	4179688.00	14.51	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL15	552066.05	4179697.84	15.83	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL16	552093.16	4179700.23	16.06	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL17	552080.03	4179699.22	15.97	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL18	552108.22	4179701.55	16.23	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL19	551957.05	4179689.01	14.48	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL20	551984.16	4179691.39	15.00	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL21	551971.03	4179690.38	14.73	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL22	551999.21	4179692.72	15.29	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL23	552012.35	4179693.73	15.48	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL24	552039.46	4179696.11	15.71	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL25	552026.33	4179695.10	15.62	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL26	552052.91	4179696.83	15.76	2.00	1.00000	5.16		1.20	2.30

Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	VOL27	551943.07	4179700.36	14.56	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL28	551941.73	4179712.70	14.91	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL29	551940.89	4179725.07	15.35	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL30	551940.18	4179737.98	15.79	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL31	551939.34	4179750.34	16.26	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL32	551937.99	4179762.68	16.74	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL33	551937.15	4179775.05	17.17	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL34	551936.35	4179785.60	17.55	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL35	551935.51	4179797.97	17.95	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL36	551934.17	4179810.31	18.33	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL37	551933.33	4179822.67	18.68	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL38	552113.57	4179703.48	16.27	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL39	552112.73	4179715.85	16.46	2.00	1.00000	5.16		1.20	2.30

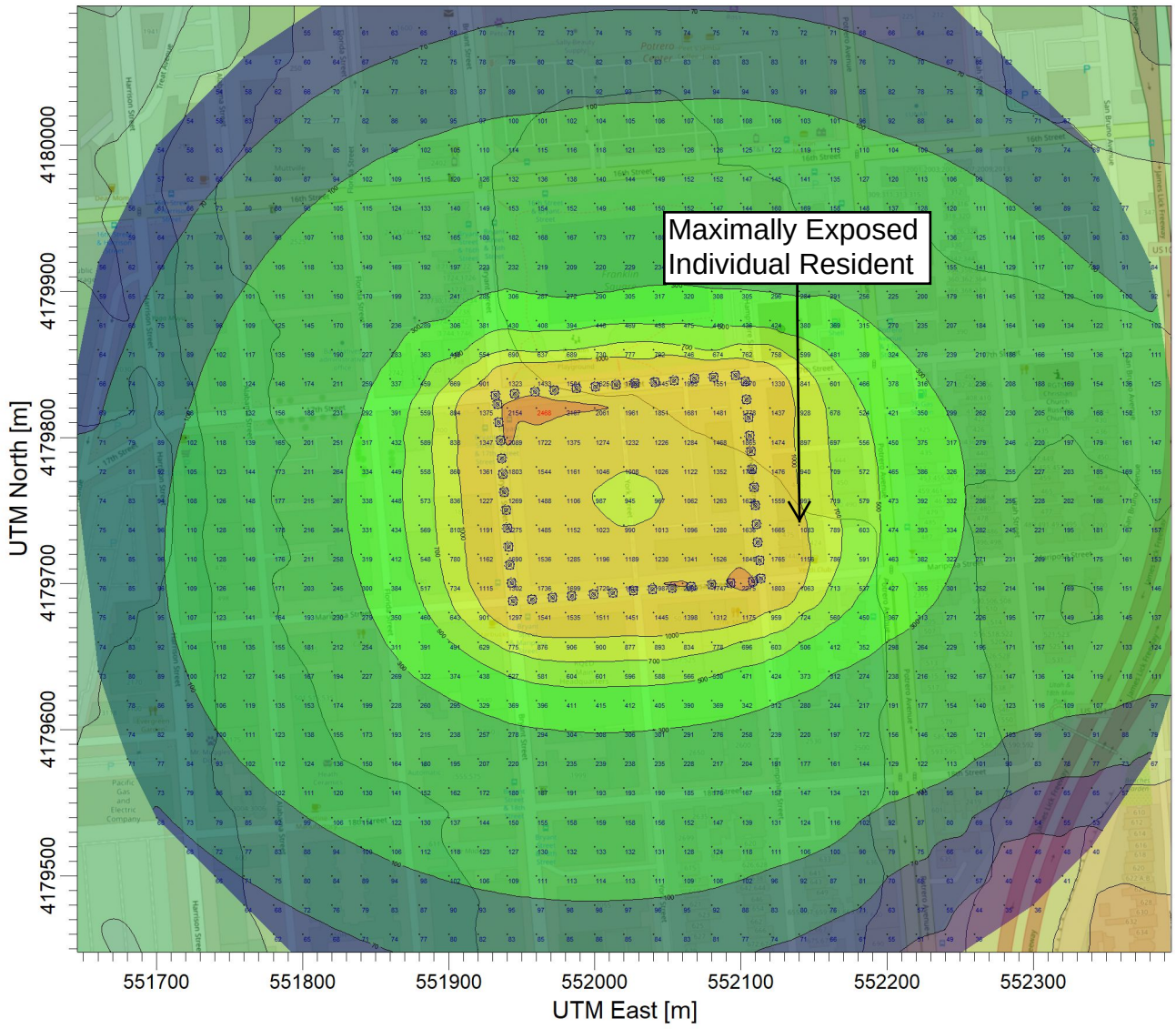
Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	VOL40	552111.38	4179728.18	17.06	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL41	552110.54	4179740.55	17.67	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL42	552109.83	4179753.46	18.33	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL43	552108.99	4179765.83	18.93	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL44	552107.65	4179778.17	19.55	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL45	552106.81	4179790.53	20.14	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL46	552106.01	4179801.09	20.64	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL47	552105.17	4179813.45	21.46	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL48	552103.82	4179825.79	22.35	2.00	1.00000	5.16		1.20	2.30
VOLUME	VOL49	552102.98	4179838.16	22.78	2.00	1.00000	5.16		1.20	2.30

PROJECT TITLE:

Potrero Yard Modernization Project
On-Road Construction Trucks Unit Emission Rate Results



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 2468 [ug/m^3] at (551960.00, 4179820.00)

35 50 70 100 300 500 700 1000 2000 2468

COMMENTS:	SOURCES: **49**		
	RECEPTORS: **1190**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:4,709 0 0.1 km	
	MAX: **2468 ug/m^3**		PROJECT NO.:

Source Pathway - Source Inputs

Source Pathway - Source Inputs

AERMOD

On-Road Operational Vehicle Trips: Volume Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	M09	552066.05	4179697.84	15.83	2.00	1.00000	5.16		1.20	2.30
VOLUME	M11	552093.16	4179700.23	16.06	2.00	1.00000	5.16		1.20	2.30
VOLUME	M10	552080.03	4179699.22	15.97	2.00	1.00000	5.16		1.20	2.30
VOLUME	M12	552106.03	4179701.00	16.21	2.00	1.00000	5.16		1.20	2.30
VOLUME	M01	551957.05	4179689.01	14.48	2.00	1.00000	5.16		1.20	2.30
VOLUME	M03	551984.16	4179691.39	15.00	2.00	1.00000	5.16		1.20	2.30
VOLUME	M02	551971.03	4179690.38	14.73	2.00	1.00000	5.16		1.20	2.30
VOLUME	M04	551999.21	4179692.72	15.29	2.00	1.00000	5.16		1.20	2.30
VOLUME	M05	552012.35	4179693.73	15.48	2.00	1.00000	5.16		1.20	2.30
VOLUME	M07	552039.46	4179696.11	15.71	2.00	1.00000	5.16		1.20	2.30
VOLUME	M06	552026.33	4179695.10	15.62	2.00	1.00000	5.16		1.20	2.30
VOLUME	M08	552052.91	4179696.83	15.76	2.00	1.00000	5.16		1.20	2.30
VOLUME	H01	552113.57	4179709.50	16.34	2.00	1.00000	5.16		1.20	2.30

Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	H02	552112.73	4179721.87	16.74	2.00	1.00000	5.16		1.20	2.30
VOLUME	H03	552111.38	4179734.20	17.35	2.00	1.00000	5.16		1.20	2.30
VOLUME	H04	552110.54	4179746.57	18.00	2.00	1.00000	5.16		1.20	2.30
VOLUME	H05	552109.83	4179759.21	18.60	2.00	1.00000	5.16		1.20	2.30
VOLUME	H06	552108.99	4179771.58	19.21	2.00	1.00000	5.16		1.20	2.30
VOLUME	H07	552107.65	4179783.91	19.83	2.00	1.00000	5.16		1.20	2.30
VOLUME	H08	552106.81	4179796.28	20.39	2.00	1.00000	5.16		1.20	2.30
VOLUME	H09	552106.01	4179806.83	21.00	2.00	1.00000	5.16		1.20	2.30
VOLUME	H10	552105.17	4179819.20	21.88	2.00	1.00000	5.16		1.20	2.30
VOLUME	H11	552103.82	4179831.54	22.64	2.00	1.00000	5.16		1.20	2.30
VOLUME	M13	552122.77	4179702.67	16.23	2.00	1.00000	5.16		1.20	2.30
VOLUME	M14	552135.90	4179703.69	16.77	2.00	1.00000	5.16		1.20	2.30
VOLUME	M16	552163.01	4179706.07	18.87	2.00	1.00000	5.16		1.20	2.30

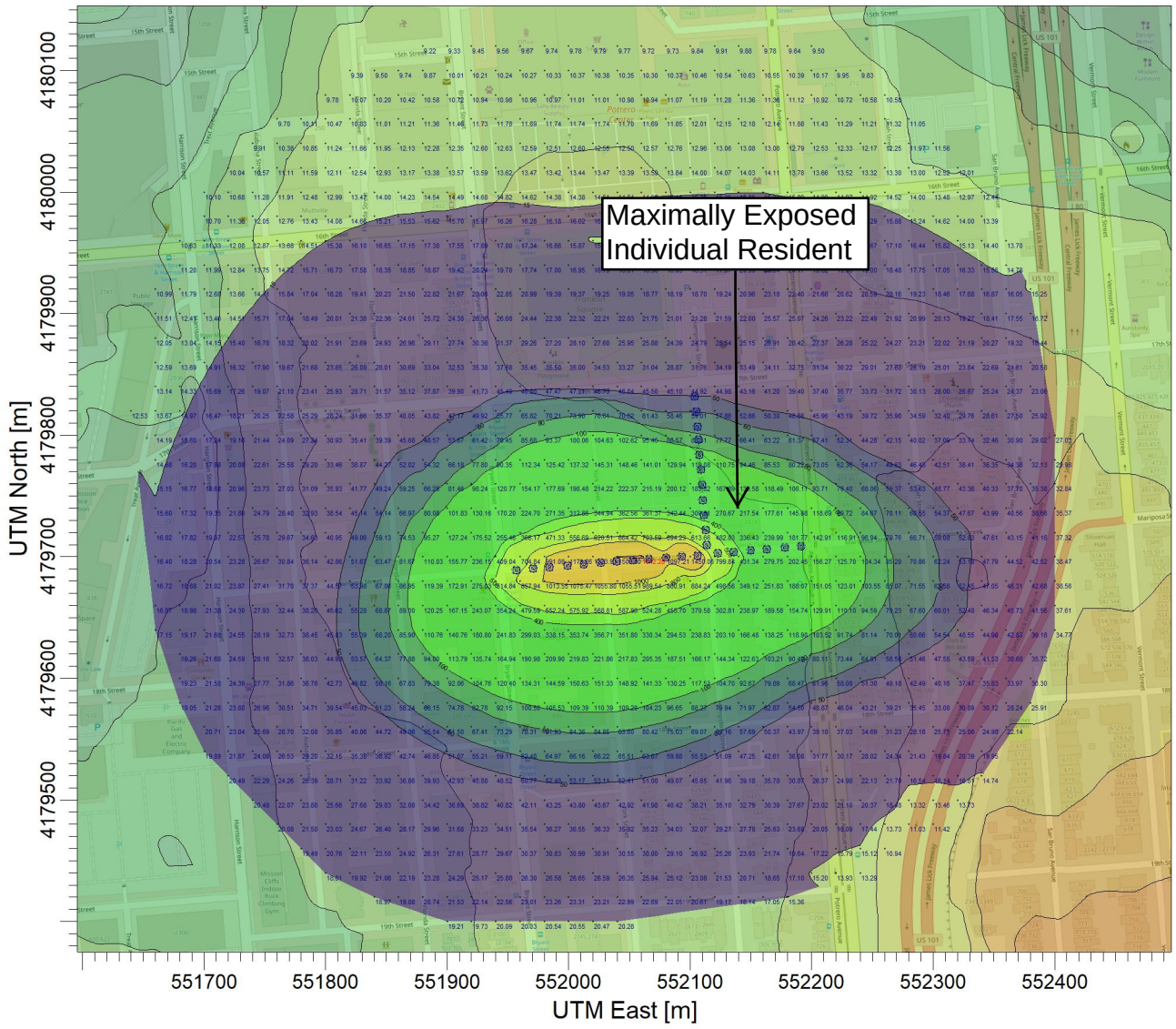
Source Pathway - Source Inputs

AERMOD

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dim. [m]	Initial Vertical Dim. [m]
VOLUME	M15	552149.88	4179705.06	17.85	2.00	1.00000	5.16		1.20	2.30
VOLUME	M17	552178.07	4179707.39	19.94	2.00	1.00000	5.16		1.20	2.30
VOLUME	M18	552191.20	4179708.41	20.92	2.00	1.00000	5.16		1.20	2.30

PROJECT TITLE:

Potrero Yard Modernization Project
On-Road Operational Vehicle Unit Emission Rate Results (Mariposa Street West)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: MWEST ug/m^3

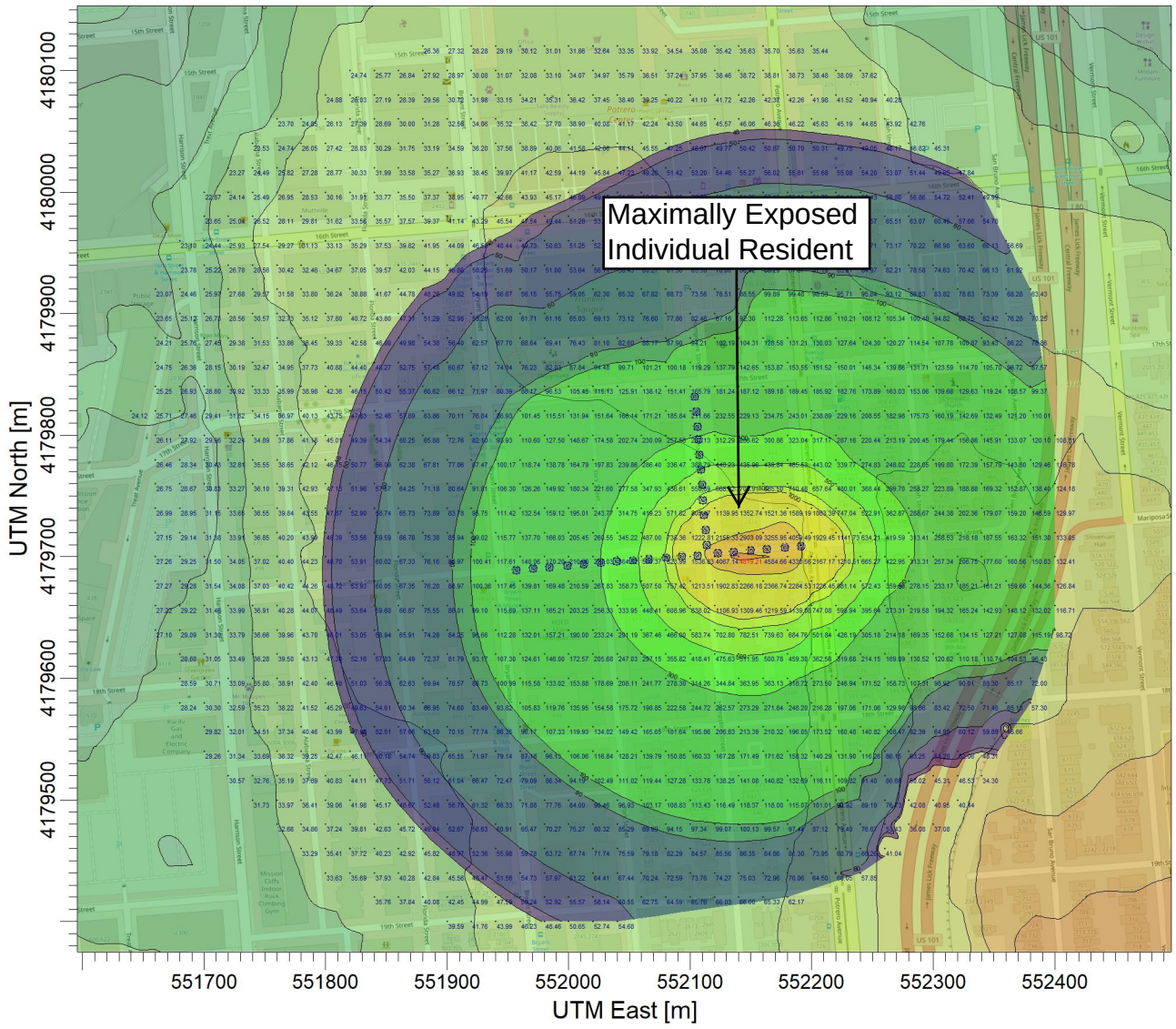
Max: 1542 [ug/m^3] at (552060.00, 4179700.00)

15 50 60 80 100 400 500 800 1000 1500 1542

COMMENTS:	SOURCES: **29**		
	RECEPTORS: **1190**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,663 0 0.2 km	
	MAX: **1542 ug/m^3**		PROJECT NO.:

PROJECT TITLE:

Potrero Yard Modernization Project
On-Road Operational Vehicle Unit Emission Rate Results (Mariposa Street East)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: MEAST ug/m^3

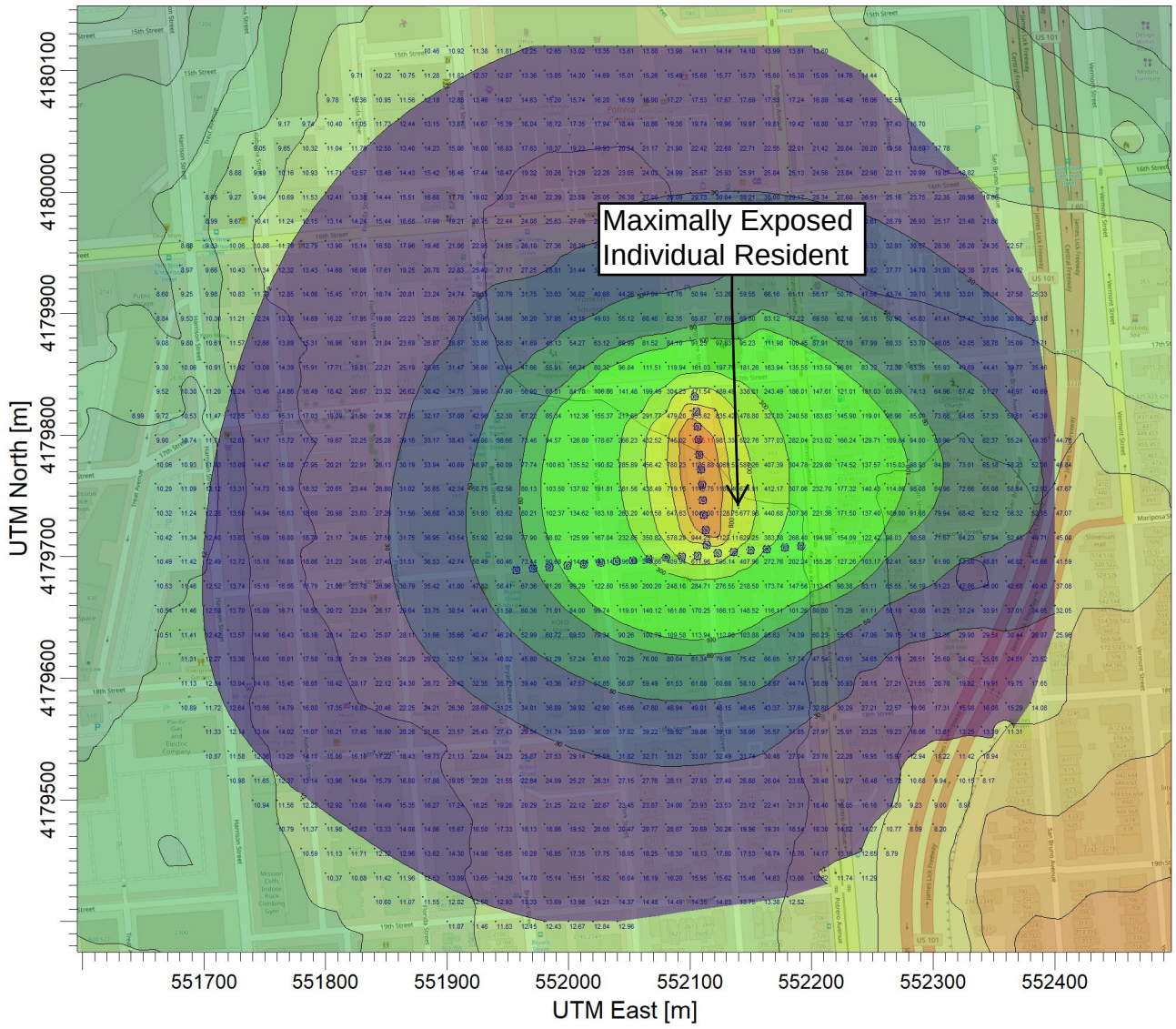
Max: 4819 [ug/m^3] at (552140.00, 4179700.00)

48 50 60 90 100 300 500 800 1000 3000 4500 4819

COMMENTS:	SOURCES: **29**	
	RECEPTORS: **1190**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,663 0 0.2 km
	MAX: **4819 ug/m^3**	PROJECT NO.:

PROJECT TITLE:

Potrero Yard Modernization Project
On-Road Operational Vehicle Unit Emission Rate Results (Hampshire Street)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: HNORTH ug/m^3

Max: 1245 [ug/m^3] at (552100.00, 4179800.00)

12 30 50 80 100 300 500 800 1000 1245

COMMENTS:	SOURCES: **29**		
	RECEPTORS: **1190**		
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,663 0 0.2 km	
	MAX: **1245 ug/m^3**		PROJECT NO.:

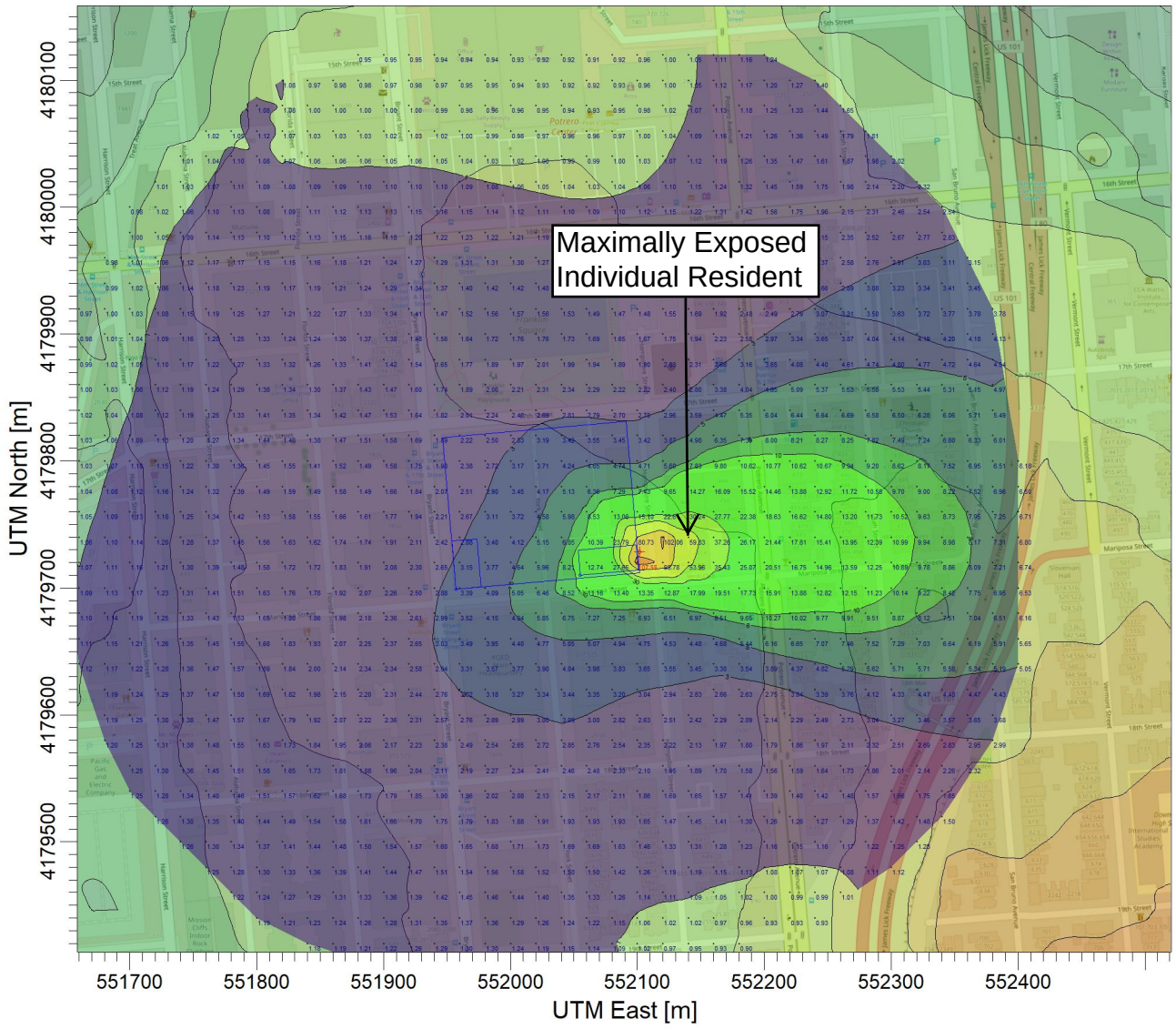
Source Pathway - Source Inputs

Diesel Emergency Generators: Point Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Gas Exit Temp. [K]	Gas Exit Velocity [m/s]	Stack Inside Diameter [m]
POINT	STCK1	552101.45	4179728.31	17.08	3.66	1.00000	739.80	45.30	0.18
		Emergency Generators Unit Emissions							

PROJECT TITLE:

Potrero Yard Modernization Project
Emergency Diesel Generators Unit Emission Rate Results



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 1 YEARS FOR SOURCE GROUP: ALL ug/m^3

Max: 108 [ug/m^3] at (552100.00, 4179720.00)

1 3 5 8 10 30 50 80 100 108

COMMENTS:	SOURCES: **1**	
	RECEPTORS: **1190**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,423 — 0 — 0.2 km
	MAX: **108 ug/m^3**	PROJECT NO.:

Potrero Yard Modernization Project
Table G-4.1: On-Road Construction Truck Emissions for Health Risk Assessment

Calculations of On-Road Construction Truck Emissions for the Health Risk Assessment

Total Construction Truck Trips	47,754
Distance Around Project Site (miles)	0.4
Total Miles Travelled around Project Site	19,102
Total DPM emissions around Project Site (grams)	461
Average Daily DPM Emissions around Project Site (grams/day)	0.59
Total $PM_{2.5}$ emissions around Project Site (grams)	2,091
Average Daily $PM_{2.5}$ Emissions around Project Site (grams/day)	2.68

Notes:
Diesel particulate matter (DPM) emissions based on EMFAC2017 running exhaust PM10 emission rates for heavy-heavy-duty trucks (HHDT).
Total $PM_{2.5}$ emissions based on EMFAC2017 running exhaust, tire wear, and brake wear emissions rates for HHDT
and a resuspended dust emission factor of 1.91.
Emissions per day based on the total duration of construction (780 work days).

Potrero Yard Modernization Project
Table G-4.2: On-Road Operational Vehicle Emissions for Health Risk Assessment

Calculations of On-Road Operational Vehicle Emissions for the Health Risk Assessment

Roadway	Vehicle Type	Fuel Type	Trip Length	Daily Traffic Volume	% of Total Traffic Volume	Daily VMT	DPM (g/day)	$PM_{2.5}$ (g/day)	TOG (g/day)
Mariposa Street West of Hampshire Street	Bus	Electric	0.11	1290	3%	4.3	--	0.299	--
Mariposa Street West of Hampshire Street	LDA	Gas	0.11	1290	96%	136.2	--	4.993	1.2150
Mariposa Street West of Hampshire Street	MHD	Diesel	0.11	1290	1%	1.4	0.01024	0.178	--
Mariposa Street East of Hampshire Street	Bus	Electric	0.06	1060	3%	1.9	--	0.134	--
Mariposa Street East of Hampshire Street	LDA	Gas	0.06	1060	96%	61.1	--	2.238	0.5446
Mariposa Street East of Hampshire Street	MHD	Diesel	0.06	1060	1%	0.6	0.00459	0.080	--
Hampshire Street North of Mariposa Street	Bus	Electric	0.09	230	3%	0.6	--	0.044	--
Hampshire Street North of Mariposa Street	LDA	Gas	0.09	230	96%	19.9	--	0.728	0.1772
Hampshire Street North of Mariposa Street	MHD	Diesel	0.09	230	1%	0.2	0.00149	0.026	--

Notes:

g/d = grams per day

The net increase in traffic volumes along roadway segments provided by the traffic consultant.

Diesel particulate matter (DPM) emissions based on EMFAC2017 running exhaust PM10 emission rates for Medium-heavy-duty trucks (MHDT).

Total $PM_{2.5}$ emissions based on EMFAC2017 running exhaust, tire wear, and brake wear emissions rates for light-duty automobiles (LDA), MHDT, and urban buses (UBUS) and a resuspended dust emission factor of 1.91. The buses are electric and would not generate exhaust emissions.

Total organic gas (TOG) emissions based on EMFAC2017 running exhaust for LDA.

Potrero Yard Modernization Project
Operational and Cumulative Traffic Data and Model Outputs

Roadway	Location	Direction	Existing Volume - No Project		Existing Volume - Plus Project		Cumulative Volume - Plus Project	
			PM Peak Hour Volume	Approximate Daily Volume	PM Peak Hour Volume	Approximate Daily Volume	PM Peak Hour Volume	Approximate Daily Volume
16th St	East of Bryant St	EB	570	5,700	570	5,700	660	6,600
		WB	1,030	10,300	1,033	10,330	1,110	11,100
	West of Bryant St	EB	490	4,900	501	5,010	580	5,800
		WB	949	9,490	955	9,550	1,040	10,400
	East of Potrero Ave	EB	579	5,790	437	4,370	710	7,100
		WB	779	7,790	797	7,970	820	8,200
	West of Potrero Ave	EB	570	5,700	570	5,700	660	6,600
		WB	1,030	10,300	1,033	10,330	1,110	11,100
17th St	East of Bryant St	EB	274	2,740	291	2,910	340	3,400
		WB	372	3,720	376	3,760	500	5,000
	West of Bryant St	EB	272	2,720	287	2,870	330	3,300
		WB	274	2,740	282	2,820	380	3,800
	East of Hampshire St	EB	287	2,870	290	2,900	350	3,500
		WB	386	3,860	386	3,860	520	5,200
	West of Hampshire St	EB	274	2,740	291	2,910	340	3,400
		WB	372	3,720	376	3,760	500	5,000
Mariposa St	East of Bryant St	EB	114	1,140	158	1,580	210	2,100
		WB	185	1,850	214	2,140	370	3,700
	West of Bryant St	EB	113	1,130	128	1,280	190	1,900
		WB	125	1,250	133	1,330	230	2,300
	East of Hampshire St	EB	111	1,110	163	1,630	220	2,200
		WB	163	1,630	217	2,170	370	3,700
	West of Hampshire St	EB	189	1,890	247	2,470	320	3,200
		WB	163	1,630	234	2,340	360	3,600
	East of York St	EB	189	1,890	247	2,470	320	3,200
		WB	163	1,630	234	2,340	360	3,600
	West of York St	EB	114	1,140	158	1,580	210	2,100
		WB	185	1,850	214	2,140	370	3,700
Bryant St	North of 16th St	NB	489	4,890	504	5,040	560	5,600
		SB	329	3,290	349	3,490	410	4,100
	South of 16th St	NB	420	4,200	438	4,380	520	5,200
		SB	280	2,800	311	3,110	360	3,600
	North of 17th St	NB	420	4,200	438	4,380	520	5,200
		SB	280	2,800	311	3,110	360	3,600
	South of 17th St	NB	317	3,170	338	3,380	420	4,200
		SB	304	3,040	334	3,340	410	4,100
	North of Mariposa St	NB	317	3,170	338	3,380	420	4,200
		SB	304	3,040	334	3,340	410	4,100
	South of Mariposa St	NB	287	2,870	287	2,870	330	3,300
		SB	328	3,280	328	3,280	440	4,400
Potrero Ave	North of 16th St	NB	553	5,530	565	5,650	620	6,200
		SB	1,089	10,890	1,101	11,010	1,400	14,000
	South of 16th St	NB	716	7,160	752	7,520	820	8,200
		SB	961	9,610	991	9,910	1,230	12,300
Hampshire St	North of 17th St	NB	5	50	5	50	20	200
		SB	18	180	18	180	30	300
	South of 17th St	NB	39	390	45	450	80	800
		SB	59	590	76	760	110	1,100
	North of Mariposa St	NB	39	390	45	450	80	800
		SB	59	590	76	760	110	1,100
	South of Mariposa St	NB	49	490	49	490	70	700
		SB	81	810	81	810	130	1,300
York St	North of Mariposa St	NB	5	50	129	1,290	140	1,400
		SB	-	-	94	940	100	1,000
	South of Mariposa St	NB	39	390	48	480	70	700
		SB	36	360	43	430	70	700

Potrero Yard Modernization Project
Operational and Cumulative Traffic Data and Model Outputs

	Intersection	Heavy Vehicle %				Bus %				Non-Bus Heavy Vehicle %			
		NB	SB	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB
1	16th St/ Bryant St	3%	3%	8%	4%	1%	1%	1%	1%	2%	2%	7%	3%
2	17th St/ Bryant St	3%	4%	3%	1%	2%	3%	2%	1%	1%	1%	1%	0%
3	Mariposa St/ Bryant St	3%	4%	3%	2%	1%	3%	1%	1%	2%	1%	2%	1%
4	Mariposa St/ York St	3%	--	4%	2%	1%		3%	1%	2%		1%	1%
5	17th St/ Hampshire St	0%	0%	4%	1%			2%		0%	0%	2%	1%
6	Mariposa St/ Hampshire St	4%	0%	3%	2%	1%		3%	1%	3%	0%	0%	1%
7	16th St/ Potrero Ave	4%	4%	9%	5%	2%	2%	2%	2%	2%	2%	7%	3%

* Based on PM Peak hour existing counts

Project Trips:	Daily
% Non-Bus HV	1%
% Bus	3%

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: SAN FRANCISCO
Calendar Year: 2026
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN. Note 'day' in the unit is operation day.

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_PMTW	PM10_PMBW	TOG_RUNEX
SAN FRANCISCO	2026	LDA	Aggregated	Aggregated	GAS	0.001	0.002	0.016	0.002	0.008	0.037	0.009
SAN FRANCISCO	2026	MHDT	Aggregated	Aggregated	DSL	0.007	0.003	0.056	0.007	0.012	0.130	0.012
SAN FRANCISCO	2026	UBUS	2026	Aggregated	DSL	0.006	0.009	0.028	0.006	0.035	0.066	0.081

Potrero Yard Modernization Project

Table G-4.3: Unit-Emission Rate Conversion Factors for each Air Pollutant Source

Scenario	Source	Pollutant	Source Type	Source Count	Hour Per Day	Total Emissions (grams/day)	Total Emissions (grams/second)	Unit Conversion Factor
Unmitigated	Off-Road Construction Equipment	DPM	Area	1	13	108.221	0.0023124	2.31E-03
	Off-Road Construction Equipment	PM2.5	Area	1	13	108.221	0.0023124	2.31E-03
	On-Road Construction Trucks	DPM	Volume	49	13	0.591	0.0000126	2.58E-07
	On-Road Construction Trucks	PM2.5	Volume	49	13	2.681	0.0000573	1.17E-06
	On-Road Operational Vehicles (Hampshire Street)	DPM	Volume	11	24	0.001	0.0000000	1.57E-09
	On-Road Operational Vehicles (Hampshire Street)	TOG	Volume	11	24	0.177	0.0000021	1.86E-07
	On-Road Operational Vehicles (Hampshire Street)	PM2.5	Volume	11	24	0.798	0.0000092	8.40E-07
	On-Road Operational Vehicles (Mariposa Street East)	DPM	Volume	6	24	0.005	0.0000001	8.85E-09
	On-Road Operational Vehicles (Mariposa Street East)	TOG	Volume	6	24	0.545	0.0000063	1.05E-06
	On-Road Operational Vehicles (Mariposa Street East)	PM2.5	Volume	6	24	2.452	0.0000284	4.73E-06
	On-Road Operational Vehicles (Mariposa Street West)	DPM	Volume	12	24	0.010	0.0000001	9.88E-09
	On-Road Operational Vehicles (Mariposa Street West)	TOG	Volume	12	24	1.215	0.0000141	1.17E-06
	On-Road Operational Vehicles (Mariposa Street West)	PM2.5	Volume	12	24	5.471	0.0000633	5.28E-06
	Emergency Diesel Generators	DPM	Point	1	24	60.397	0.0006990	6.99E-04
	Emergency Diesel Generators	PM2.5	Point	1	24	60.397	0.0006990	6.99E-04
Mitigated	Off-Road Construction Equipment (All Tier 4)	DPM	Area	1	13	38.136	0.0008149	8.15E-04
	Off-Road Construction Equipment (All Tier 4)	PM2.5	Area	1	13	38.136	0.0008149	8.15E-04
	Emergency Diesel Generators (All Tier 4)	DPM	Point	1	24	8.997	0.0001041	1.04E-04
	Emergency Diesel Generators (All Tier 4)	PM2.5	Point	1	24	8.997	0.0001041	1.04E-04

Appendix G-5

Project Update to the Citywide Health Risk Assessment Database
(electronically submitted to the San Francisco
Environmental Planning Department)

Appendix G-6

Air Quality Modeling Uncertainties

1. AIR QUALITY MODELING UNCERTAINTIES

In accordance with the Air Quality and Health Risk Assessment Methodology prepared for the Potrero Yard Modernization Project, this following is a summary the modeling uncertainties for the air quality analysis.

1.1 Emissions Estimates

There are a number of uncertainties associated with the estimation of emissions from each of the source categories considered that may affect the subsequent estimation of exposure concentrations and risk characterization. For example, uncertainties associated with the estimation of emissions from on-road motor vehicles may affect the subsequent estimation of exposure concentrations and risk characterization. Emission factors from EMFAC2017 were used to estimate on-road vehicle emissions for cars and trucks and, as with any emissions model, there were also uncertainties associated with these. For example, on September 27, 2019, the U.S. Environmental Protection Agency and the National Highway Traffic Safety Administration published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program.[1] The SAFE Vehicle Rule Part One revokes California's authority to set its own greenhouse gas emission standards and zero-emission vehicle mandates, which affects some of the underlying assumptions in the EMFAC2017 model. Since these changes would not affect light-duty gasoline-powered cars, which represent about 95 percent of the new vehicle trips generated by the proposed project, the effect of the SAFE ruling on the project's on-road vehicle emission estimates would likely be negligible.

1.2 Modeling Approach

In addition to uncertainty associated with emission estimates, there is also uncertainty associated with the estimated exposure concentrations. The limitations of the AERMOD air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to U.S. Environmental Protection Agency, errors due to the limitation of the algorithms implemented in the air dispersion model in the highest estimated concentrations of +/-10 percent to 40 percent are typical.[2] In San Francisco, with its many multi-story and high-rise buildings, urban flow patterns are likely influenced by recirculation and channeling in urban canyons. The dispersion modeling does not account for such patterns. Not capturing these effects and using meteorological data from a single monitoring site to represent transport throughout the City add to errors and uncertainties in the modeling approach.

1.3 Risk Characterization Methods

Numerous assumptions must be made in order to estimate human exposure to chemicals. These assumptions include parameters such as breathing rates, exposure time and frequency, exposure duration, and human activity patterns. While a mean value derived from scientifically defensible studies is a reasonable estimate of central tendency, the exposure variables used in this assessment are only estimates. The California Environmental Protection Agency (CalEPA) and Office of Environmental Health Hazard Assessment (OEHHA) cancer potency factors (CPFs) for toxic air contaminants were used to

[1] 84 Fed. Reg. 51,310.

[2] U.S. Environmental Protection Agency. 2005. Guideline on Air Quality Models (Revised). 40 Code of Federal Regulations, Part 51, Appendix W. Office of Air Quality Planning and Standards. November 2005.

estimate cancer risks associated with exposures to diesel particulate matter for the emission sources modeled. However, the CPF values for diesel particulate matter are uncertain in both the estimation of response and dose. Public health and regulatory organizations such as the U.S. Environmental Protection Agency agree that diesel exhaust may cause cancer in humans. However, there is significant uncertainty in the value applied for the CPF. Furthermore, this evaluation quantifies risk based on the maximally exposed individual resident, while some receptor locations may be workplaces or recreational areas where the overall exposure would be significantly less. The method applied to estimate cancer risk includes the age-specific exposure factors recommended by CalEPA/OEHHA which increases the effective CPF to account for increased sensitivity of the young to cancer-causing pollutants. However, there may be pollutants in the urban environment whose cancer toxicity is magnified in ways that are not accounted for because of the presence of other pollutants (synergic effects) or because of pre-existing conditions or sensitivities. Furthermore, there may be pollutants whose toxicity is not yet recognized or quantified and, as such, is unaccounted for in this risk assessment.

APPENDIX H

Pedestrian Wind Study

REPORT

SFMTA POTRERO YARD MODERNIZATION PROJECT

SAN FRANCISCO, CA

PEDESTRIAN WIND STUDY
RWDI # 2000654
September 4, 2020

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed SFMTA Potrero Yard Modernization Project in San Francisco, CA (Image 1). Based on our wind-tunnel testing for the proposed development under the Existing, Existing + Project and Project + Cumulative configurations (Images 2A through 2C), and the local wind records (Image 3), the potential wind comfort and hazard conditions are predicted as shown on site plans in Figures 1A through 2C, while the associated wind speeds are listed in Tables 1.1 through 3. These results can be summarized as follows:

Wind Comfort:

- Existing wind speeds around the project site average 13 mph across all tested locations at grade level. For wind comfort conditions in the Existing + Project and Project + Cumulative configurations, average wind speeds are expected to be 12 mph and 11 mph, respectively.

- In the Existing configuration, 47 out of 70 grade level locations exceed the 11-mph criterion. In the Existing + Project and Project + Cumulative configurations, the number of locations at grade level where winds are predicted to exceed the 11-mph criterion are 37 and 31, respectively out of 70.

- At the podium level, average wind speeds are expected to be 15 mph, with 20 out of 27 locations exceeding the 11-mph criterion for both the Existing + Project and Project + Cumulative configurations.

Wind Hazard:

- Wind speeds comply with the hazard criterion at all tested locations except two (2) in the Existing configuration.

- With the addition of proposed project and wind reduction measures (proposed landscaping, re-entrant corner and porous north, east and west façade) in the Existing + Project and Project + Cumulative configurations, wind speeds are expected to comply with the hazard criterion at all but two (2) locations at grade level, with reduced total hours of hazardous winds.

- In the Existing + Project configuration, wind speeds at all but three (3) locations on the podium locations are predicted to comply with the hazard criterion. In the Project + Cumulative configuration, the number of locations that do not comply with the hazard criterion is expected to be four (4) on the podium level.

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1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed SFMTA Potrero Yard Modernization Project in San Francisco, CA. This report presents the project objectives, background and approach, and discusses the results of RWDI's assessment.

1.1 Project Description

The SFMTA Potrero Yard Modernization Project site is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south and Bryant Street to the west (Image 1). The project site is occupied by the existing bus maintenance facility, including a large, low building on the east portion of the site and a parking lot on the west portion.

The elevation of the project site changes approximately 27 feet from the lowest southwest corner to the highest northeast corner. Surrounding buildings are low and dense in all directions. The only exception is the open Franklin Square public park to the immediate north of the site.

The proposed project would consist of redeveloping the current bus maintenance facility into a multi-use site that would include a replacement bus facility, residential and commercial uses, and open spaces on the podium. The podium would be 6 stories above Mariposa Street (75 feet), including primarily the proposed bus maintenance facility, administration, commercial use and housing. Above the podium would be the proposed mixed income housing from Floor 7 to Floor 13. The tallest building elements would be located near the southwest and southeast corners of the site, for a total height of approximately 150 feet above local grade.

Public areas around the development site would include building entrances, sidewalks surrounding the site, Franklin Square public park to the immediate north and potentially podium open spaces at Floor 7 of the proposed development.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local wind conditions in pedestrian areas on and around the study site and provide recommendations for minimizing adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to appropriate criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including public sidewalks.

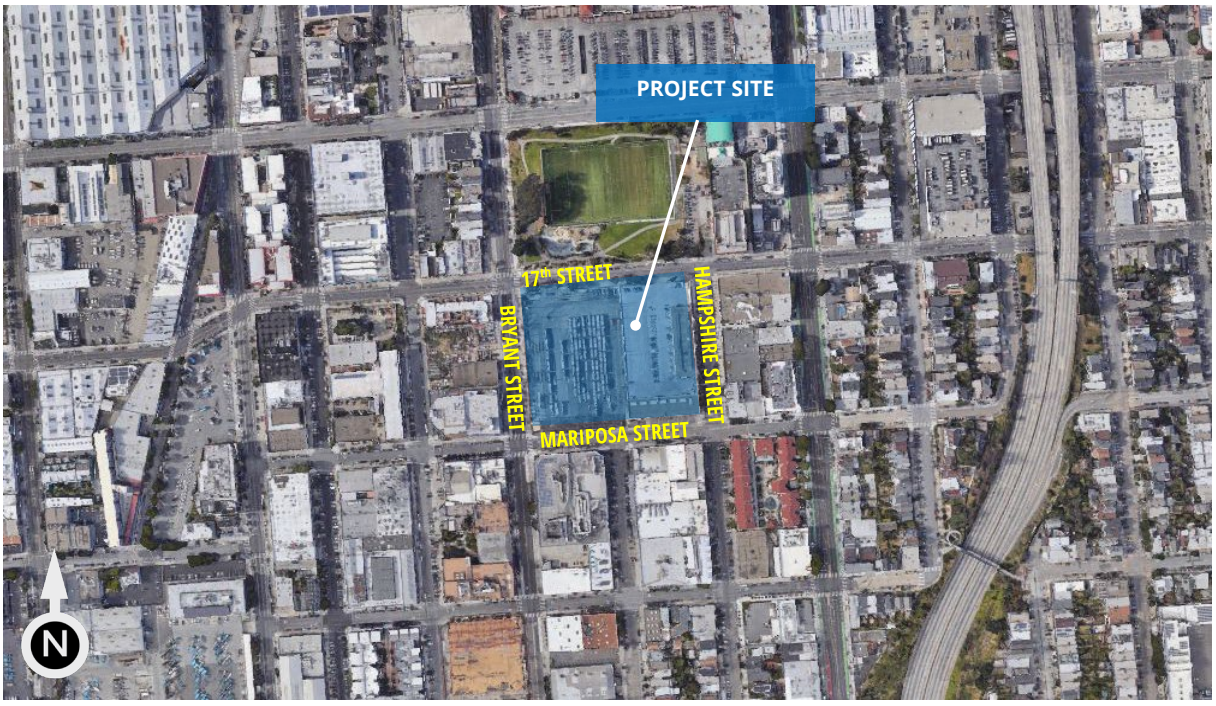


Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed project, a 1:300 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

A - Existing:	Existing site with existing surroundings (Image 2A),
B - Proposed:	Proposed project with existing surroundings (Image 2B), and,
C - Future:	Proposed project with existing and future surroundings (Image 2C).

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 1,600 ft radius of the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 109 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 5 ft above local grade in pedestrian areas throughout the study site. The first 70 sensors are located at grade level and sensors 71 through 97 were instrumented on the podium level. Bike lane locations (sensors 98 through 109) were also used to measure wind speeds for informational purpose. Wind speeds were measured for 16 directions in a 22.5-degree increment. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site, and reviewed by the Planning Department.

RWDI conducted an initial wind tunnel testing of the Existing, Existing + Project and Project + Cumulative configurations in March 2020. These results can be found in Appendix B1. The preliminary wind tunnel testing identified increased wind speeds at a number of locations compared to the existing wind conditions that exceeded the wind hazard criterion. Following the initial test, RWDI developed wind control measures to address these areas, in conjunction with the design team and the Planning Department. The existing configuration model was also revised to reflect the influence of local terrain changes and existing landscaping. In addition to the revised existing configuration, two mitigation configurations (Options 1 and 2) were tested to mitigate the wind hazards in May 2020. The results of these wind tunnel tests can be found in Appendix B2. The results from the mitigation tests showed improvement on the wind conditions, but they were not enough to mitigate the hazard exceedances on-site, particularly at the southwest corner.

A third round of testing was conducted with some additional mitigation options (Options 3 through 7) in June 2020. The results of the third round of wind tunnel testing are shown in Appendix B3. Prior to the third round of wind tunnel testing, RWDI learned that the bus parking garage would include porous facades on the north, east and west sides for natural ventilation as well as to avoid complex HVAC system design and cost. These building features were incorporated in the mitigation testing along with other mitigation options such as vertical wind screens at grade level, proposed landscaping, re-entrant building corner, and vertical elevated screens on the west façade. The addition of all these options addressed the exceedance of the wind hazard criterion at the southwest corner of the project site. Therefore, the mitigation configuration with the least number of wind control measures was finalized. The conceptual design that addressed the exceedance of the wind hazard criterion includes porous north, east and west facades of the parking garage, re-entrant corner at the southwest corner of the building up to 12 feet in height and proposed landscaping (Previously tested as Option 7).

This report presents the results of the latest wind tunnel test for the Existing + Project and Project + Cumulative configurations with the wind reduction measures (Option 7 from the wind tunnel test), along with the revised Existing configuration. Appendices B1 through B3 contain all other mitigation results.

Image 2A: Wind Tunnel Study Model – Existing Configuration

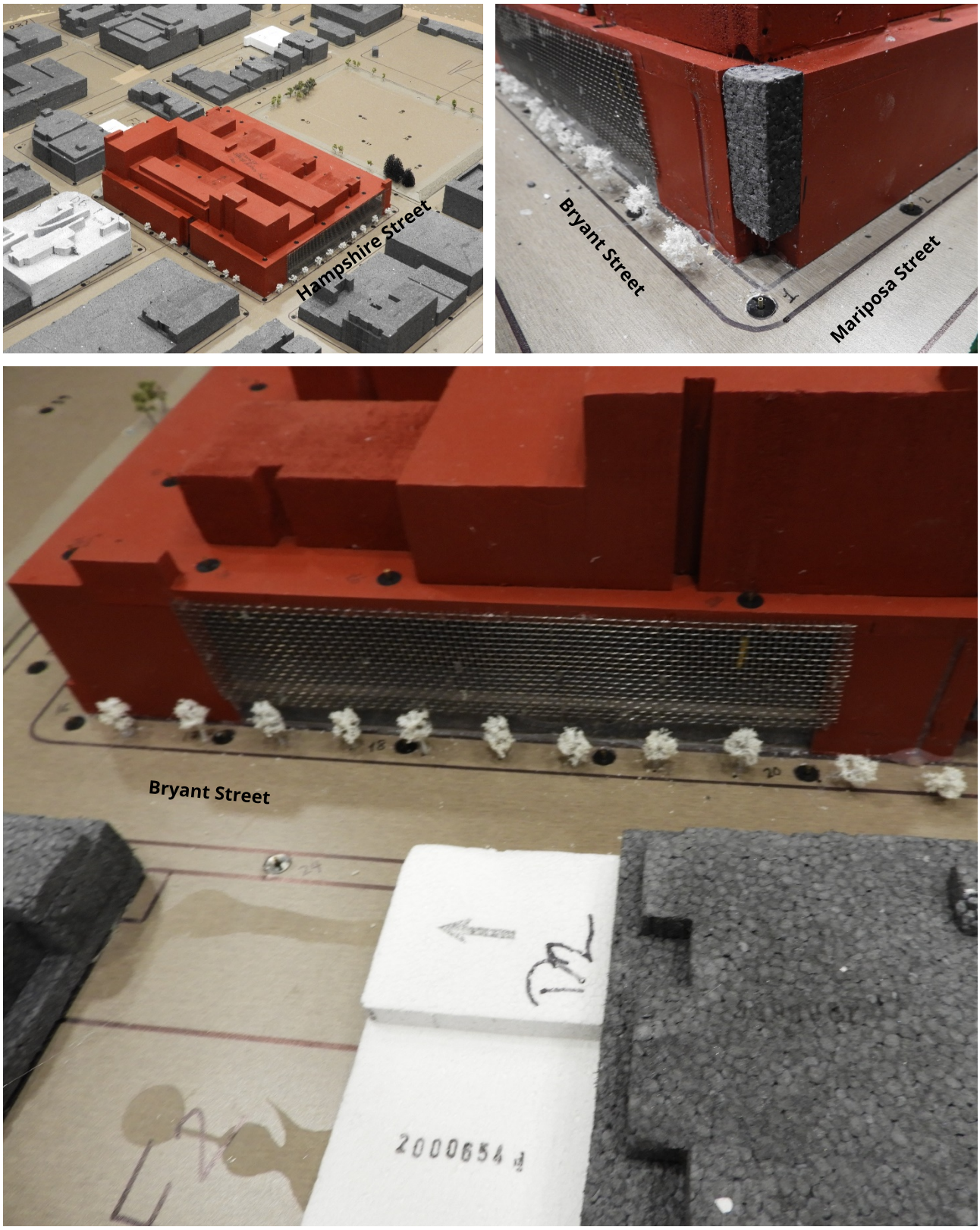


Image 2B: Wind Tunnel Study Model – Existing + Project Configuration

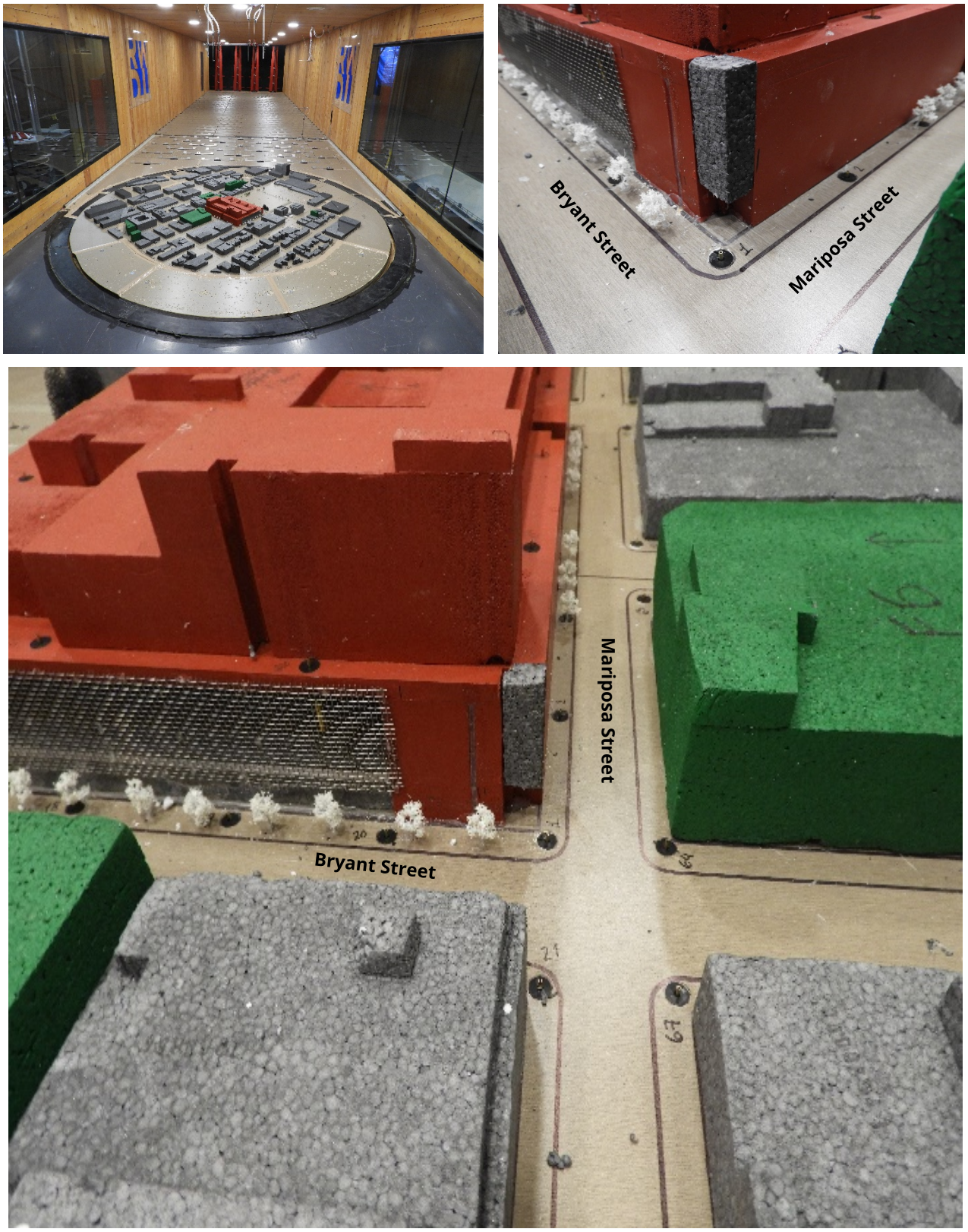


Image 2C: Wind Tunnel Study Model – Project + Cumulative Configuration

2.2 Cumulative Buildings

Anticipated future buildings within the study model radius were included in the Project + Cumulative configuration. These are shown in Image 3 and listed in the table below.

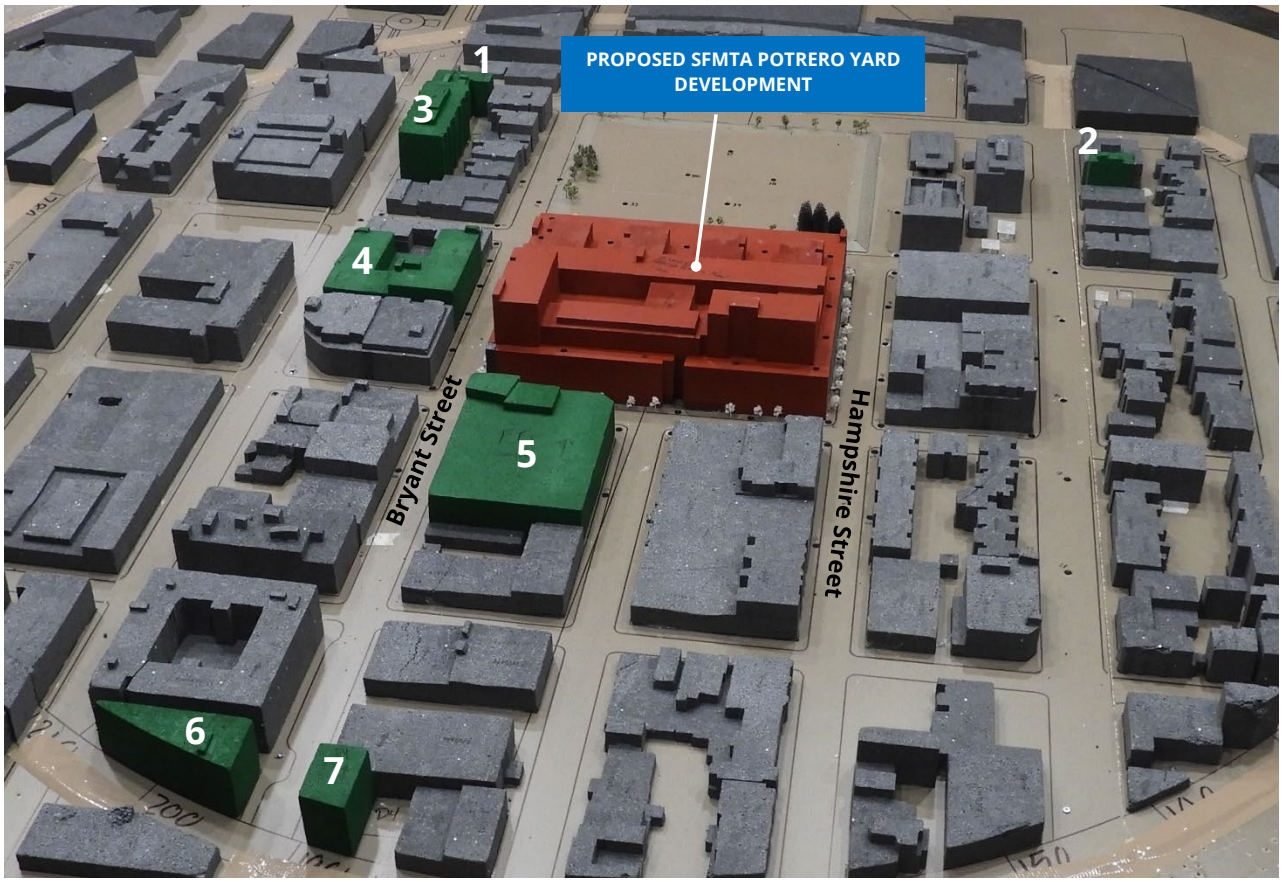


Image 3: Cumulative Buildings

LIST OF CUMULATIVE BUILDINGS AND HEIGHTS		
#	Address	Height
1	2435-2445 16TH Street	68'/ 78'
2	333-335 Potrero Avenue	64'/ 74'
3	321 Florida Street	104'
4	1850 Bryant Street	68'
5	2601 Mariposa Street	63'-6"/ 75'
6	681 Florida Street	87'/96'
7	2750 19th Street	68/ 77'-7"

2.3 Meteorological Data

Data describing the speed, direction and frequency of occurrence of winds were gathered at the old San Francisco Federal Building at 50 United Nations Plaza (at a height of 132 ft.) during the six-year period, 1945 to 1951. Average wind speeds in San Francisco are the highest in the summer and lowest in winter. However, the strongest peak winds occur in winter. Throughout the year the highest wind speeds occur in mid-afternoon and the lowest in the early morning. Westerly to northwesterly winds are the most frequent and strongest winds during all seasons. Of the primary wind directions, four have the greatest frequency of occurrence and make up the majority of the strong winds that occur. These winds include the northwest, west-northwest, west and west-southwest.

Wind statistics were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared against the criteria for wind comfort and hazard as stated in the San Francisco Planning Code Section 148 (see ***Appendix A***).

2.4 Planning Code Requirements

San Francisco Planning Code Section 148, Reduction of Ground-level Wind Currents in Downtown Commercial (C-3) Districts, requires buildings in the C-3 downtown districts to be shaped so as not to cause ground-level wind currents to exceed defined comfort and hazard criteria. (see ***Appendix A***).

The comfort criteria are that wind speeds will not exceed, more than 10% of the time, 11 mph in substantial pedestrian use areas, and 7 mph in public seating areas. Similarly, the hazard criterion of the Code requires that buildings not cause equivalent wind speeds to reach or exceed the hazard level of 26 mph as averaged from a single full hour of the year. The hazard criterion is based on winds that are measured for one hour and averaged, corresponding to a one-minute average of 36 mph.

The Planning Code defines these wind speeds in terms of equivalent wind speeds and they are calculated according to the specifications in the San Francisco Planning Code Section 148, whereby the mean hourly wind speed is increased when the turbulence intensity is greater than 10% according to the following formula:

$$\boldsymbol{EWS} = \boldsymbol{V_m} \times (\mathbf{2} \times \boldsymbol{TI} + \mathbf{0.7})$$

Where: $\boldsymbol{EWS}$ = equivalent wind speed

$\boldsymbol{V_m}$ = mean pedestrian − level wind speed

$\boldsymbol{TI}$ = turbulence intensity.

As the project site is located outside the C-3 District, it is not subject to Planning Code Section 148. However, the wind hazard criterion is used as a threshold to determine if a proposed project would result in a significant impact under the California Environmental Quality Act (CEQA).

3 RESULTS AND DISCUSSION

This section presents the results of the wind tunnel measurements analyzed in terms of equivalent wind speeds as defined by the equation in Section 2.4. The text of the report simply refers to the data as wind speeds.

The wind comfort results for the configurations tested are graphically depicted on a site plan in Figures 1A through 1C located in the "Figures" sections of this report where locations have been color-coded according to the criteria of the 7-mph and 11-mph comfort categories explained in the Planning Code (***Appendix A***). This same data is also numerically depicted in Table 1.1 and Table 1.2, located in the "Tables" section of this report. For each measurement point, the measured 10% exceeded (90th percentile) wind speed and the percentage of time that the wind speed exceeds 11 mph are listed. The point is marked as a comfort exceedance if the 11-mph threshold is exceeded. A letter "e" in the last column of each configuration indicates a wind comfort exceedance.

Tables 2.1 and 2.2 present the wind hazard results for grade level and podium level, respectively, and list the predicted wind speeds to be exceeded one hour per year. The predicted number of hours per year that the Section 148 wind hazard criterion (one-minute wind speed of 36 mph) is exceeded is also provided. A letter "e" in the last column of each configuration indicates a wind hazard exceedance. Figures 2A through 2C depicts these locations on and around the project site.

Table 3 presents the mean wind speeds at select bike lane locations for information purposes. These locations are shown in a site plan in Image 3.

3.1 Existing Configuration

3.1.1 Wind Comfort

For the Existing configuration, the average 90th percentile wind speed for the 70 test locations is approximately 13 mph. Wind speeds at 47 of 70 test locations exceed the Planning Code's pedestrian-comfort criterion of 11 mph. Winds currently exceed the applicable criterion 17-% of the time on average (Table 1.1 and Figure 1a).

3.1.2 Wind Hazard

The wind hazard criterion is currently exceeded at two test locations to the northeast of the project site (Locations 44 and 47) for the Existing configuration for a total of 30 hours per year (Figure 2a and Table 2.1). For all locations, the average wind speed which is exceeded for 1 hour per year is 25 mph (Table 2.1).

3.2 Existing plus Project Configuration

3.2.1 Wind Comfort

Compared to the Existing configuration, the addition of the proposed project would result in better wind comfort conditions around the project site. The average 90th percentile wind speed for the 70 grade level test locations would be 12 mph. The wind speeds at 37 test locations (out of 70) would exceed the Planning Code's pedestrian-comfort criterion of 11 mph (Figure 1b). Winds would exceed the 11-mph comfort criterion approximately 14% of the time (Table 1.1).

On the podium amenity level, the average 90th percentile wind speed for the 27 test locations would be 15 mph. The wind speeds at a total of 20 test locations (out of 27) would exceed the Planning Code's pedestrian-comfort criterion of 11 mph (Figure 1b). Winds would exceed the 11-mph comfort criterion approximately 28% of the time (Table 1.2).

3.2.2 Wind Hazard

At grade level, the addition of the proposed project would result in two hazard locations (Locations 44 and 48 in Figure 2B). Of these, the wind hazard exceedance at Location 44 is an existing condition, and the wind hazard exceedance at Location 48 is new. An existing wind hazard exceedance at Location 47 would be eliminated with the addition of the proposed project. For all 70 locations, the average wind speed, which is exceeded for 1 hour per year, would decrease from 25 mph for the Existing configuration to 23 mph. The total number of hours per year that winds would exceed the applicable hazard criterion would decrease by 12 hours, from 30 to 18 (Table 2.1 and Figure 2B).

On the podium amenity level, the wind hazard criterion would be exceeded at three of 27 test locations (Locations 74, 84 and 92 in Figure 2B). For all locations, the average wind speeds which is exceeded for 1 hour per year is 29 mph (Table 2.2).

3.3 Project plus Cumulative Configuration

3.3.1 Wind Comfort

The addition of the approved cumulative (future) developments in the surrounding area would further reduce ground-level wind speeds compared to the Existing and Existing + Project configurations. The average 90th percentile wind speed for the 70 test locations at grade level would be 11 mph with the wind speeds at 31 test locations exceeding the Planning Code's pedestrian-comfort criterion of 11 mph. Winds would exceed the 11-mph comfort criterion approximately 13% of the time (Table 1.1).

On the podium amenity level, the average 90th percentile wind speed for the 27 test locations would be 15 mph, which is similar to the Existing + Project configuration. The wind speeds at a total of 20 test locations (out of 27) would exceed the Planning Code's pedestrian-comfort criterion of 11 mph (Figure 1C). Winds would exceed the 11-mph comfort criterion approximately 27% of the time (Table 1.2).

3.3.2 Wind Hazard

For the Project + Cumulative configuration, the total number of locations exceeding the wind hazard criterion at grade level would be two (Figure 1C), the same as the Existing + Project configuration. The total number of hours per year that winds would exceed the wind hazard criterion would decrease by seven hours (from 18 to 11) when compared to the Existing + Project configuration. For all locations, the average wind speed would be 22 mph (Table 2.1).

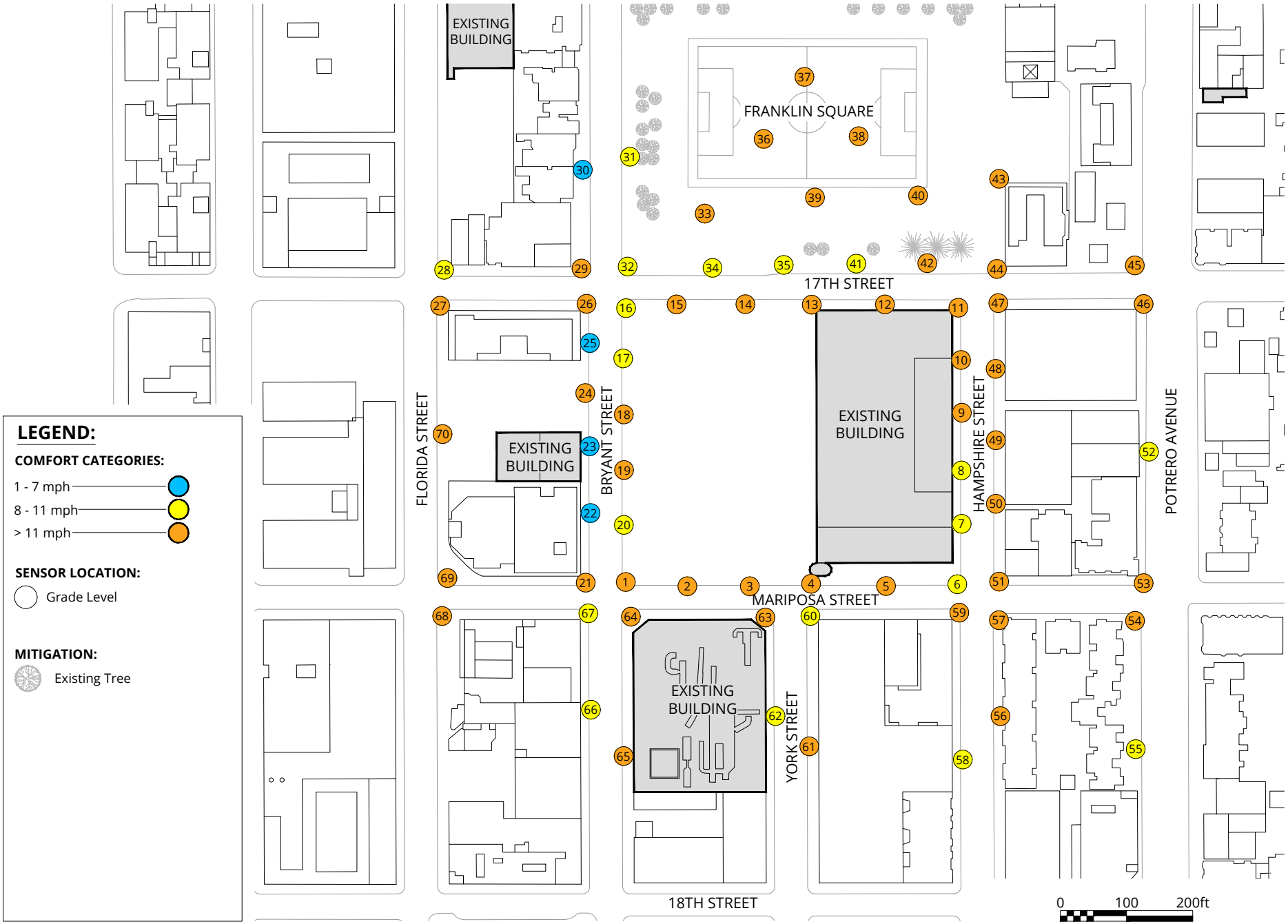
On the podium amenity level, the wind hazard criterion would be exceeded at four of 27 test locations (Locations 74, 83, 84 and 92 in Figure 2C). For all locations, the average wind speeds which is exceeded for 1 hour per year is 29 mph (Table 2.2).

4 APPLICABILITY OF RESULTS

The wind conditions presented in this report pertain to the model of the SFMTA Potrero Yard Modernization Project constructed using the conceptual design drawings and information listed below. Design changes that deviate from this list of drawings, including building materials, may change the wind condition predictions presented. Changes in the design should be reviewed by RWDI or a qualified wind consultant, to assess their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
191205_SFMTA Bus Yards_Potrero Yard_ToSWCA	.skp	9/12/2019
191205_SFMTA Bus Yards_Potrero Yard_ToSWCA	.dwg	9/12/2019
SFMTA_Potrero_3 Level Full Plan Set_022019 (1)	pdf	8/06/2020

FIGURES



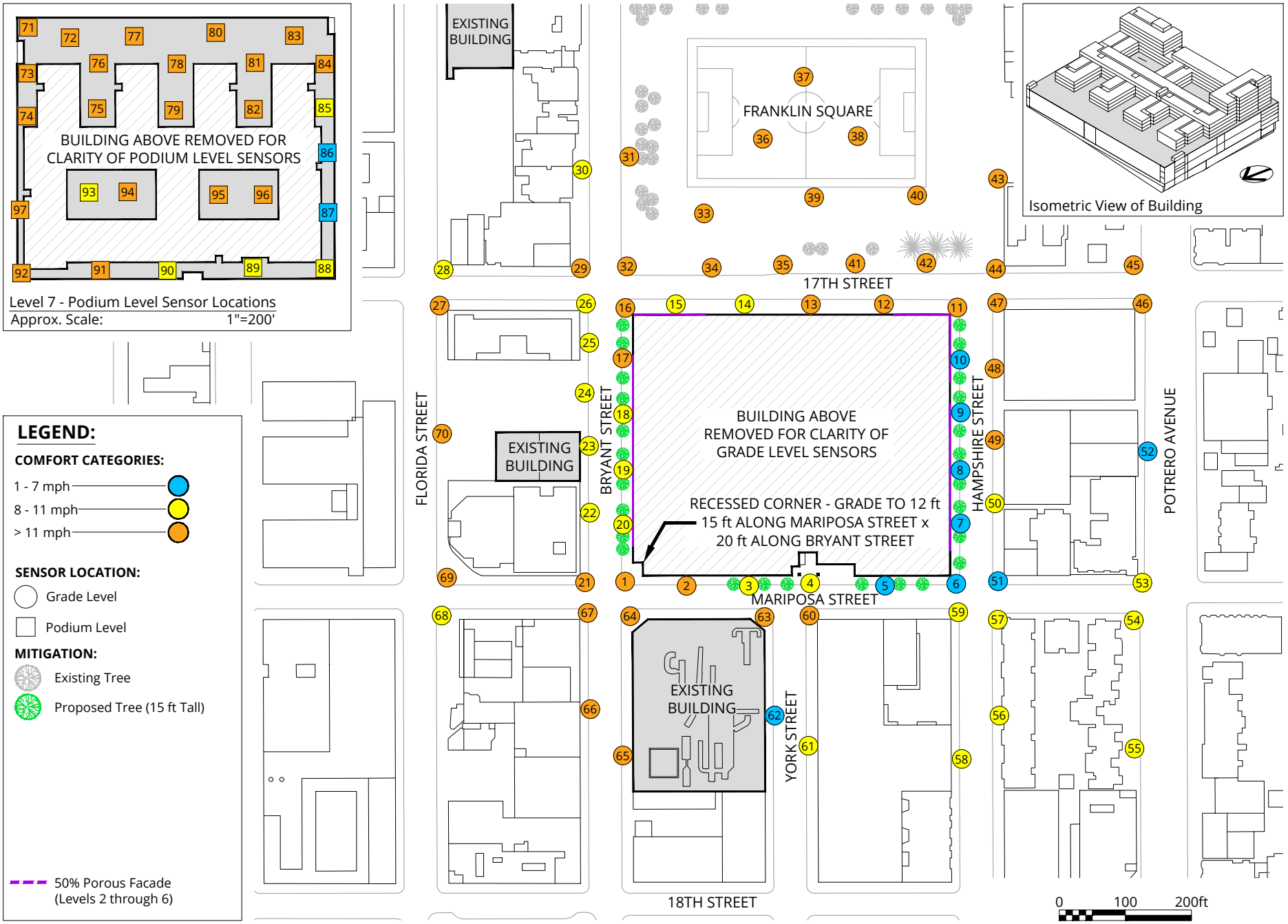
Pedestrian Wind Comfort Conditions
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1A
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Pedestrian Wind Comfort Conditions

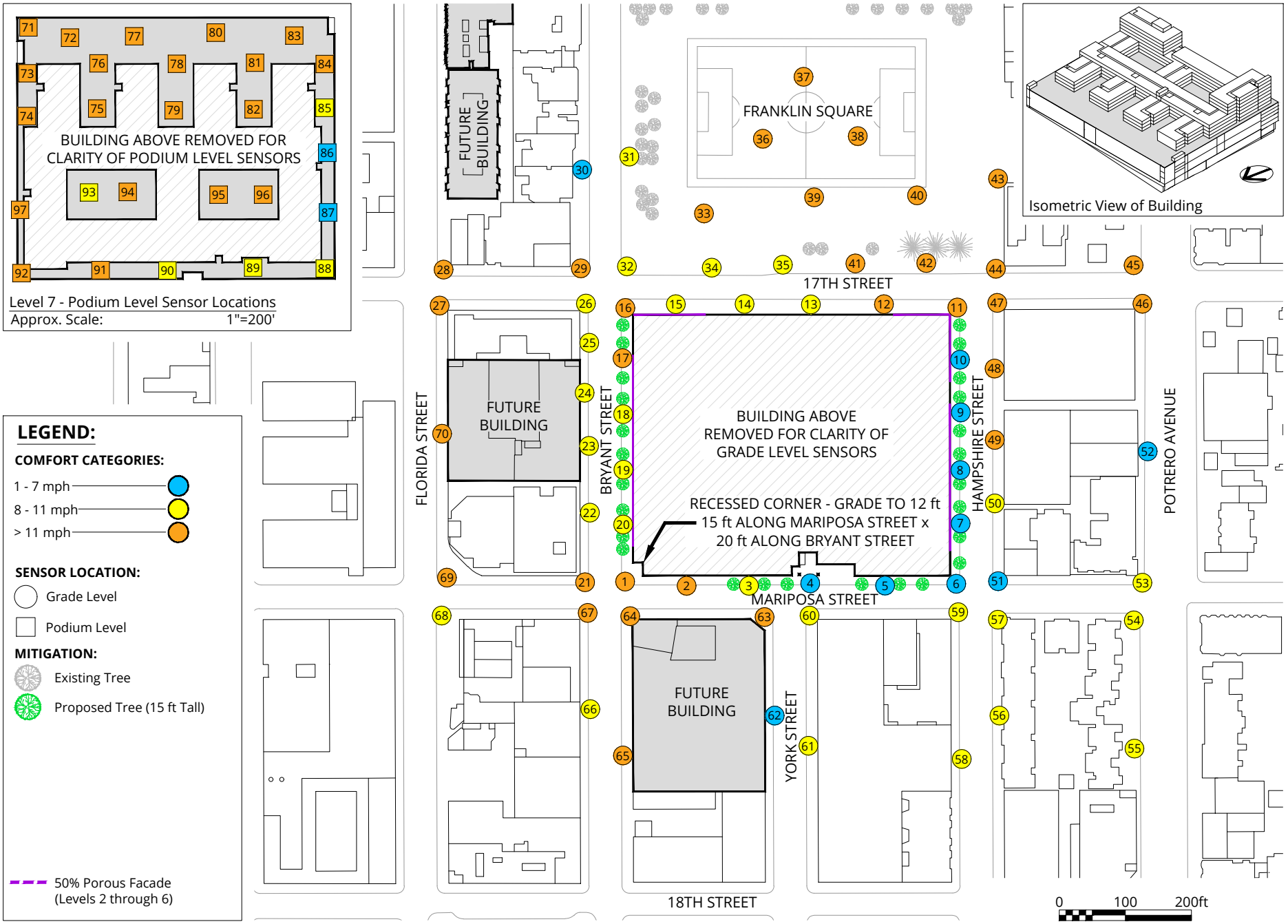
Existing + Project
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure: 1B
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Pedestrian Wind Comfort Conditions

Project + Cumulative

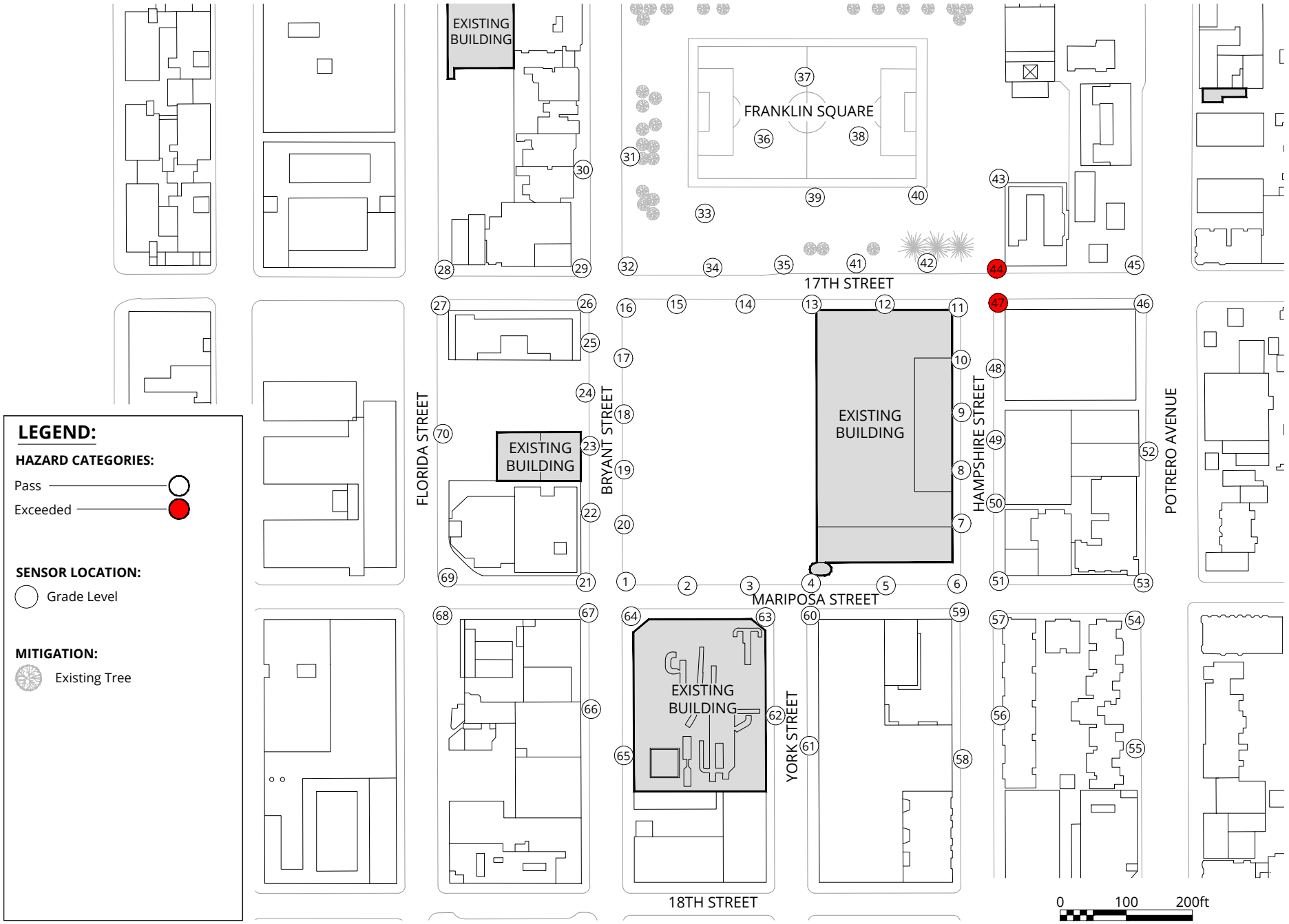
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1C
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



LEGEND:

HAZARD CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

MITIGATION:

Existing Tree

Pedestrian Wind Hazard Conditions

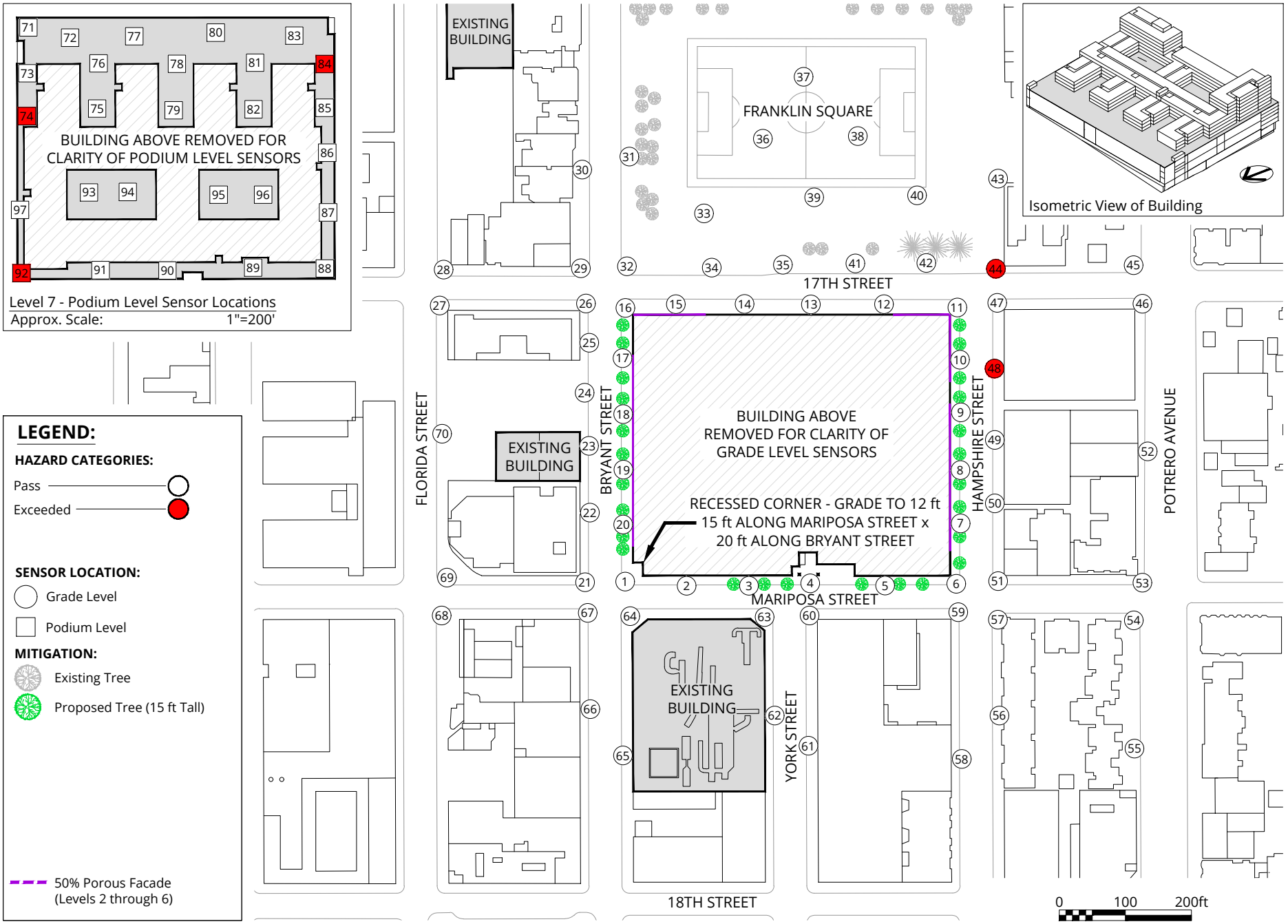
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2A
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Pedestrian Wind Hazard Conditions

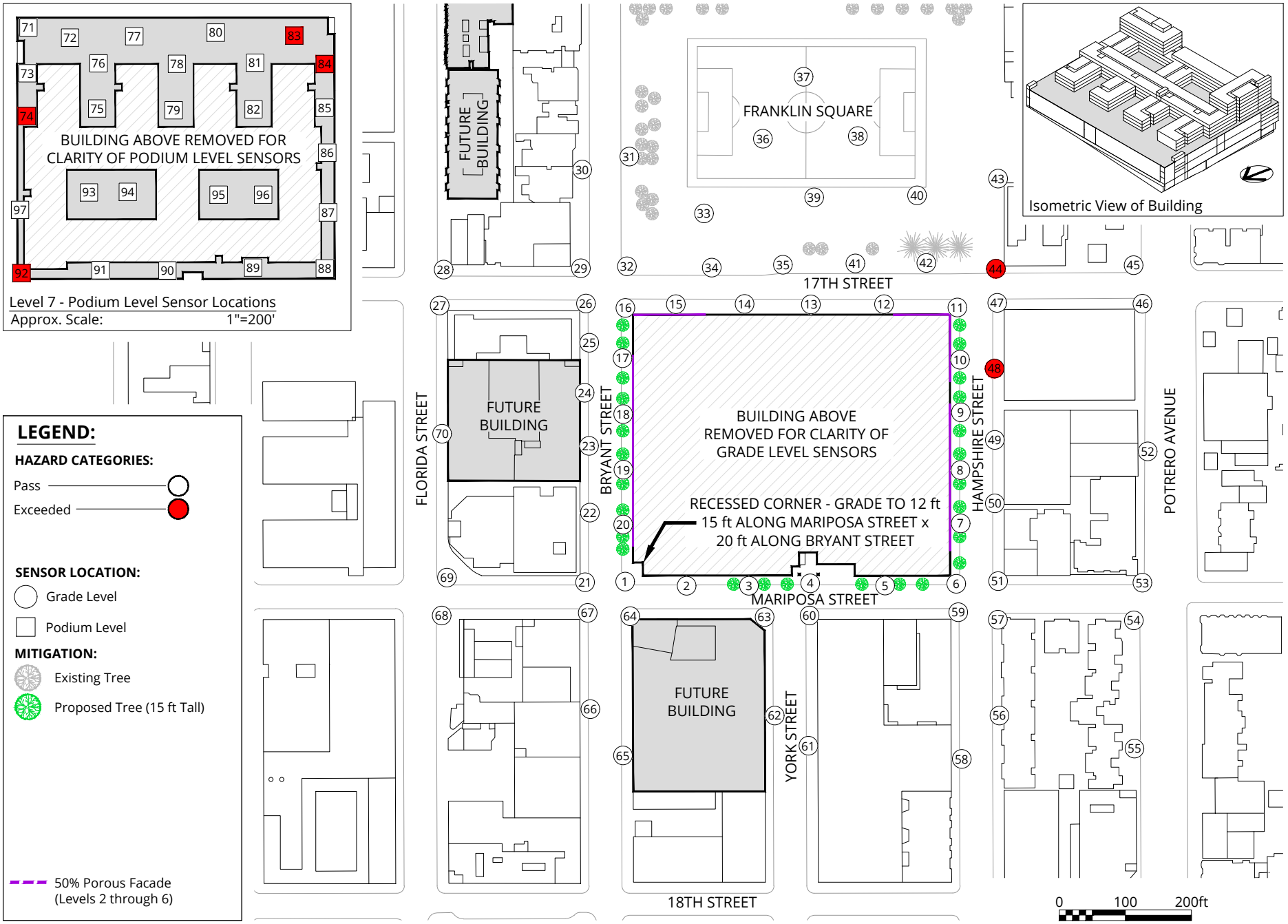
Existing + Project
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure: 2B
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Pedestrian Wind Hazard Conditions

Project + Cumulative

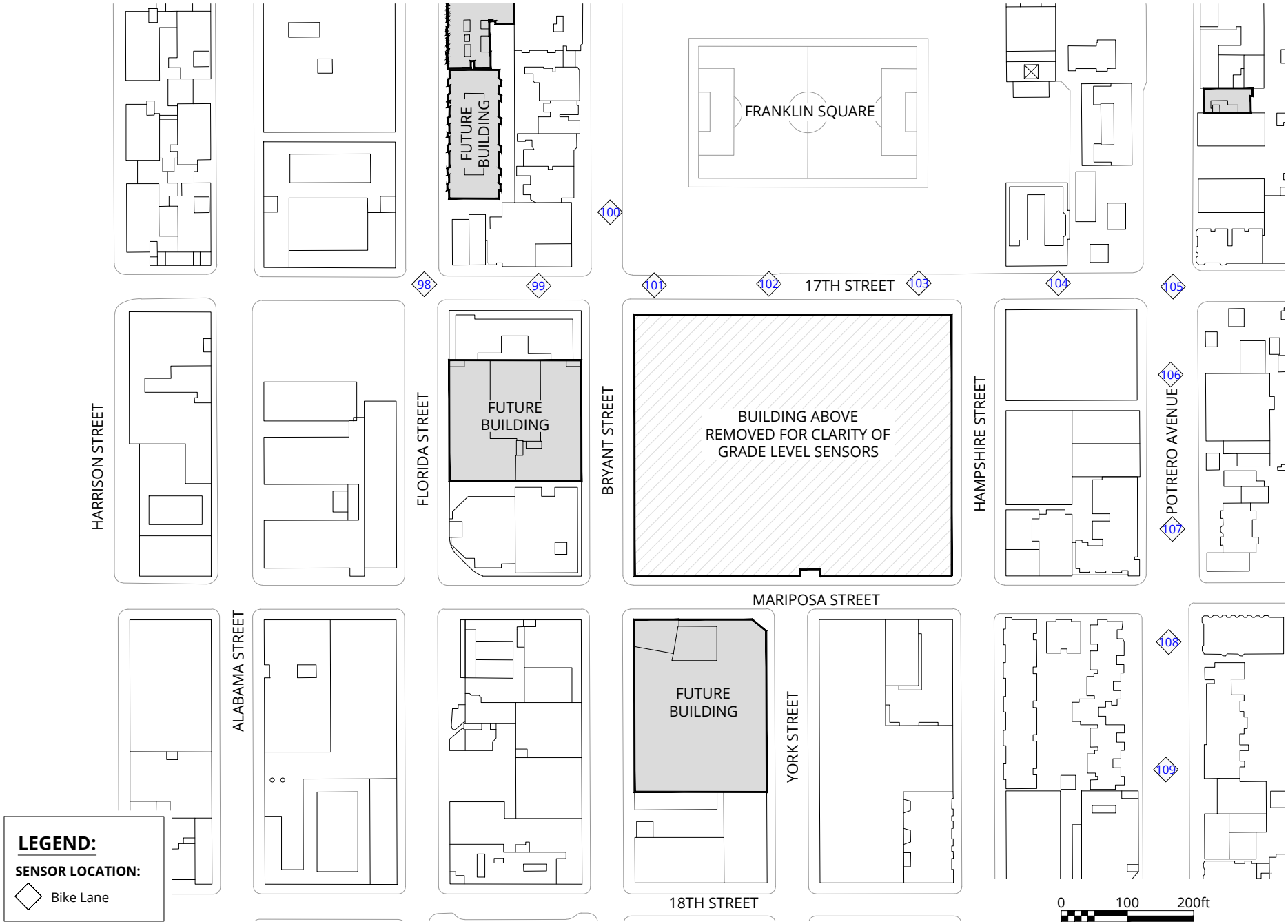
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2C
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Bike Lane Test Locations

True North

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

Drawn by: DF	Figure: 3□	
Approx. Scale: 1"=200'		
Date Revised: Mar. 4, 2020		

TABLES

Table 1.1: Wind Comfort Conditions

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
1	12	18	e	16	30	4	e	15	25	3	e
2	12	12	e	13	17	1	e	12	15	0	e
3	12	14	e	9	4	-3		11	10	-1	
4	12	17	e	8	1	-4		7	1	-5	
5	13	15	e	7	0	-6		6	0	-7	
6	11	10		7	1	-4		7	0	-4	
7	10	6		6	0	-4		5	0	-5	
8	11	10		6	0	-5		5	0	-6	
9	12	13	e	6	0	-6		6	0	-6	
10	14	23	e	6	0	-8		7	0	-7	
11	17	32	e	16	28	-1	e	16	28	-1	e
12	13	15	e	14	19	1	e	13	16	0	e
13	14	22	e	12	12	-2	e	11	10	-3	
14	13	18	e	11	10	-2		10	8	-3	
15	12	13	e	11	10	-1		10	5	-2	
16	10	6		15	28	5	e	12	16	2	e
17	9	4		12	13	3	e	12	13	3	e
18	13	15	e	11	10	-2		11	10	-2	
19	13	18	e	9	5	-4		8	1	-5	
20	10	7		11	10	1		10	6	0	
21	13	17	e	13	20	0	e	14	21	1	e
22	7	1		10	8	3		9	3	2	
23	7	1		10	6	3		10	5	3	
24	13	20	e	11	10	-2		10	7	-3	
25	6	0		9	3	3		10	4	4	
26	12	13	e	9	5	-3		10	6	-2	
27	14	22	e	15	25	1	e	15	28	1	e
28	10	7		10	6	0		16	28	6	e
29	12	13	e	12	13	0	e	12	15	0	e
30	6	1		8	1	2		7	0	1	
31	11	10		12	18	1	e	11	10	0	
32	11	10		13	18	2	e	10	7	-1	
33	13	21	e	13	21	0	e	12	16	-1	e
34	11	10		13	17	2	e	11	10	0	
35	10	7		12	13	2	e	11	10	1	
36	13	17	e	13	17	0	e	12	14	-1	e
37	16	30	e	15	27	-1	e	15	25	-1	e
38	15	27	e	14	25	-1	e	14	23	-1	e
39	15	25	e	14	22	-1	e	13	21	-2	e
40	13	20	e	13	18	0	e	13	16	0	e
41	11	10		12	16	1	e	12	13	1	e
42	14	22	e	14	24	0	e	14	22	0	e
43	15	28	e	14	25	-1	e	15	26	0	e
44	21	46	e	22	50	1	e	21	47	0	e
45	15	25	e	13	16	-2	e	12	13	-3	e
46	16	29	e	15	27	-1	e	16	27	0	e
47	19	43	e	17	31	-2	e	17	33	-2	e

Table 1.1: Wind Comfort Conditions

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											

Summary	Average (mph)	Average (%)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total
	13	17	47 ---- 70	12	14	-1	37 ---- 70	11	13	-2	31 ---- 70

Table 1.2: Wind Comfort Conditions - Podium Level

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
71											
72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
87											
88											
89											
90											
91											
92											
93											
94											
95											
96											
97											

Summary	Average (mph)	Average (%)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total
	-	-	-	15	28	-	20 ---- 27	15	27	-	20 ---- 27

Table 2.1: Wind Hazard Conditions

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
1	23	0		31	0	0		28	0	0	
2	23	0		24	0	0		23	0	0	
3	25	0		18	0	0		21	0	0	
4	23	0		15	0	0		15	0	0	
5	24	0		14	0	0		12	0	0	
6	21	0		15	0	0		14	0	0	
7	19	0		12	0	0		11	0	0	
8	21	0		11	0	0		9	0	0	
9	22	0		12	0	0		11	0	0	
10	28	0		14	0	0		14	0	0	
11	34	0		32	0	0		32	0	0	
12	27	0		30	0	0		29	0	0	
13	26	0		25	0	0		25	0	0	
14	26	0		21	0	0		22	0	0	
15	23	0		20	0	0		18	0	0	
16	18	0		29	0	0		23	0	0	
17	19	0		25	0	0		26	0	0	
18	26	0		20	0	0		21	0	0	
19	26	0		19	0	0		16	0	0	
20	24	0		24	0	0		20	0	0	
21	23	0		28	0	0		26	0	0	
22	16	0		21	0	0		17	0	0	
23	17	0		18	0	0		18	0	0	
24	25	0		20	0	0		19	0	0	
25	11	0		18	0	0		19	0	0	
26	23	0		18	0	0		19	0	0	
27	24	0		27	0	0		27	0	0	
28	20	0		19	0	0		35	0	0	
29	21	0		22	0	0		23	0	0	
30	15	0		16	0	0		15	0	0	
31	25	0		23	0	0		22	0	0	
32	22	0		23	0	0		22	0	0	
33	27	0		25	0	0		21	0	0	
34	21	0		21	0	0		20	0	0	
35	19	0		21	0	0		22	0	0	
36	24	0		24	0	0		24	0	0	
37	31	0		27	0	0		27	0	0	
38	29	0		27	0	0		27	0	0	
39	28	0		26	0	0		27	0	0	
40	25	0		24	0	0		24	0	0	
41	21	0		23	0	0		24	0	0	
42	26	0		27	0	0		27	0	0	
43	30	0		26	0	0		27	0	0	
44	44	28	e	41	16	-12	e	40	10	-18	e
45	32	0		26	0	0		22	0	0	
46	35	0		31	0	0		32	0	0	
47	38	2	e	32	0	-2		32	0	-2	

Table 2.1: Wind Hazard Conditions

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											

Summary	Average (mph)	Total Hours	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total
	25	30	2 ---- 70	23	18	-12	2 ---- 70	22	11	-19	2 ---- 70

Table 2.2: Wind Hazard Conditions - Podium Level

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
71											
72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
87											
88											
89											
90											
91											
92											
93											
94											
95											
96											
97											

Summary	Average (mph)	Total Hours	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total
	-	-	-	29	99	-	3 ---- 27	29	75	-	4 ---- 27

Table 3: Bike Lane Wind Conditions - Informational

		Existing + Project	
Location		Mean Wind Speed (mph)	
98		6	
99		6	
100		6	
101		8	
102		7	
103		8	
104		8	
105		7	
106		7	
107		7	
108		6	
109		7	
SUMMARY	**Average (mph)**	**Average (mph)**	**Average (mph)**
	7	**7**	**7**

APPENDIX A

APPENDIX A:

San Francisco Planning Code Section 148
Reduction of Ground-Level Wind Currents In C-3 Districts

a) Requirement and Exception. In C-3 Districts, buildings and additions to existing buildings shall be shaped, or other wind-baffling measures shall be adopted, so that the developments will not cause ground-level wind currents to exceed, more than 10 percent of the time year round, between 7:00 a.m. and 6:00 p.m., the comfort level of 11 m.p.h. equivalent wind speed in areas of substantial pedestrian use and seven m.p.h. equivalent wind speed in public seating areas.

When preexisting ambient wind speeds exceed the comfort level, or when a proposed building or addition may cause ambient wind speeds to exceed the comfort level, the building shall be designed to reduce the ambient wind speeds to meet the requirements. An exception may be granted, in accordance with the provisions of Section 309, allowing the building or addition to add to the amount of time that the comfort level is exceed by the least practical amount if (1) it can be shown that a building or addition cannot be shaped and other wind-baffling measures cannot be adopted to meet the foregoing requirements without creating an unattractive and ungainly building form and without unduly restricting the development potential of the building site in question, and (2) it is concluded that, because of the limited amount by which the comfort level is exceeded, the limited location in which the comfort level is exceeded, or the limited time during which the comfort level is exceeded, the addition is insubstantial.

No exception shall be granted and no building or addition shall be permitted that causes equivalent wind speeds to reach or exceed the hazard level of 26 miles per hour for a single hour of the year.

b) Definition. The term "equivalent wind speed" shall mean an hourly mean wind speed adjusted to incorporate the effects of gustiness or turbulence on pedestrians.

c) Guidelines. Procedures and Methodologies for implementing this section shall be specified by the Office of Environmental Review of the Department of City Planning. (added by Ord. 414-85, App. 9/17/85)

APPENDIX B1

PRELIMINARY RESULTS

SFMTA POTRERO YARD

SAN FRANCISCO, CA

PEDESTRIAN WIND STUDY
RWDI # 2000654
March 5, 2020

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed SFMTA Potrero Yards in San Francisco, CA (Image 1). Based on our wind-tunnel testing for the proposed development under the Existing, Existing + Project and Project + Cumulative configurations (Images 2A through 2C), the potential wind comfort and hazard conditions are predicted as shown on site plans in Figures 1A through 2C, while the associated wind speeds are listed in Tables 1.1 through 2.2. Nearby bike lane test locations are shown in Figure 3 and the associated mean wind speeds for those bike lane locations are listed in Table 3. The results can be summarized as follows:

Wind Comfort:

- Existing wind speeds around the project site are expected to average 13 mph across all tested locations. For wind comfort conditions In the Existing + Project and Project + Cumulative configurations, average wind speeds are expected to remain as 13 mph.

- In the Existing configuration, 46 out of 70 grade level locations are expected to exceed to 11-mph criterion. In the Existing + Project and Project + Cumulative configurations, the number of locations at grade level where winds are predicted to exceed the 11-mph criterion are 42 and 44 respectively.

- At the podium level, average wind speeds are expected to be 15 mph, with 20 out of 27 locations exceeding the 11-mph criterion for both Existing + Project and Project + Cumulative configurations.

Wind Hazard:

- Wind speeds are expected to comply with the hazard criterion at all tested locations except three (3) in the Existing configuration.

- With the addition of proposed project, wind speeds are expected to comply with the hazard criterion at all but four (4) locations at grade level.

- With the addition of the future developments in the Project + Cumulative configuration, wind speeds at all but six (6) locations are predicted to comply with the hazard criterion at grade level.

- In the Existing + Project configuration, wind speeds at all but three (3) locations on the podium locations are predicted to comply with the hazard criterion. In the Project + Cumulative configuration, the number of locations that do not comply with the hazard criterion is expected to be four (4) at the podium level.

While referring to the Pedestrian Wind Criteria description that follows, we encourage the design team to review the results and assess them against the intended pedestrian usage at specific locations. If there are locations where improved conditions are desired, the RWDI team is prepared to discuss and suggest conceptual wind control strategies. Additional commentary regarding background on wind flow patterns, wind comfort levels, and any further recommendations for wind control measures to help moderate wind activity in areas of high wind activity will be presented within the final report. Prior to issuing the report, we suggest that we have a teleconference to go over the results and discuss the types/locations/feasibilities of possible wind control measures.

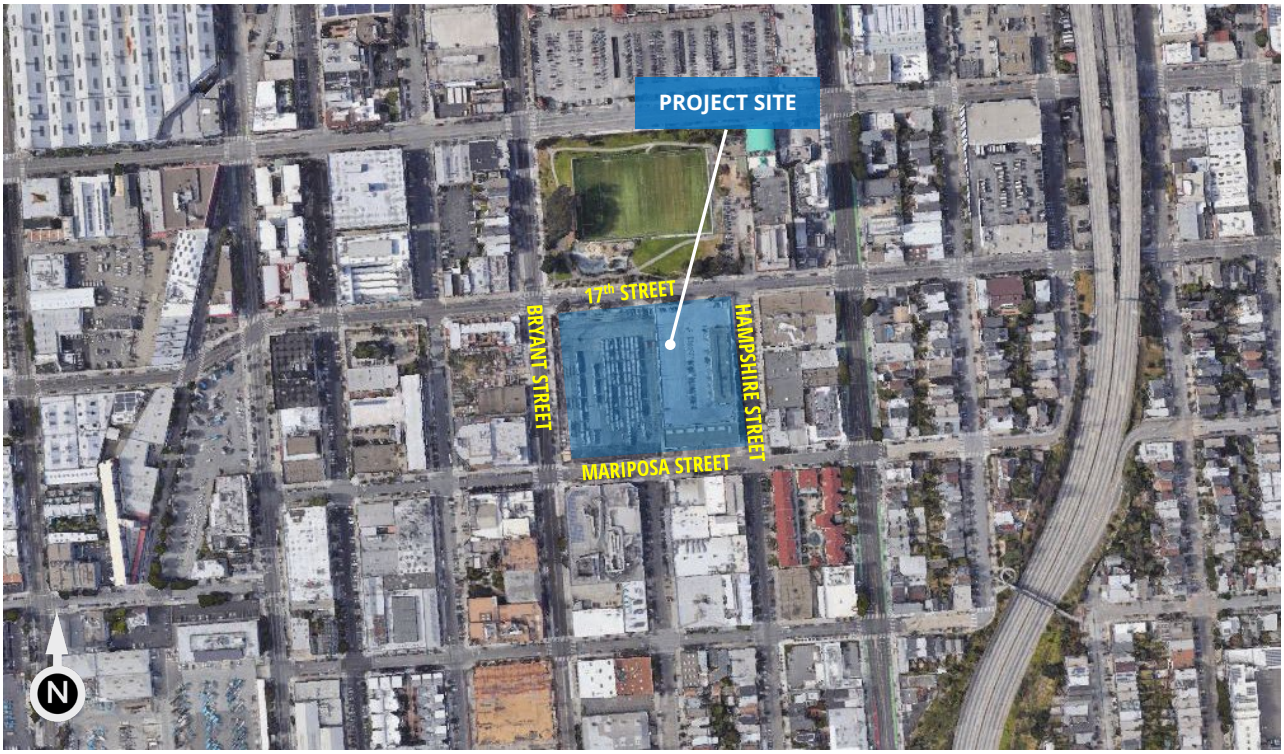


Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth

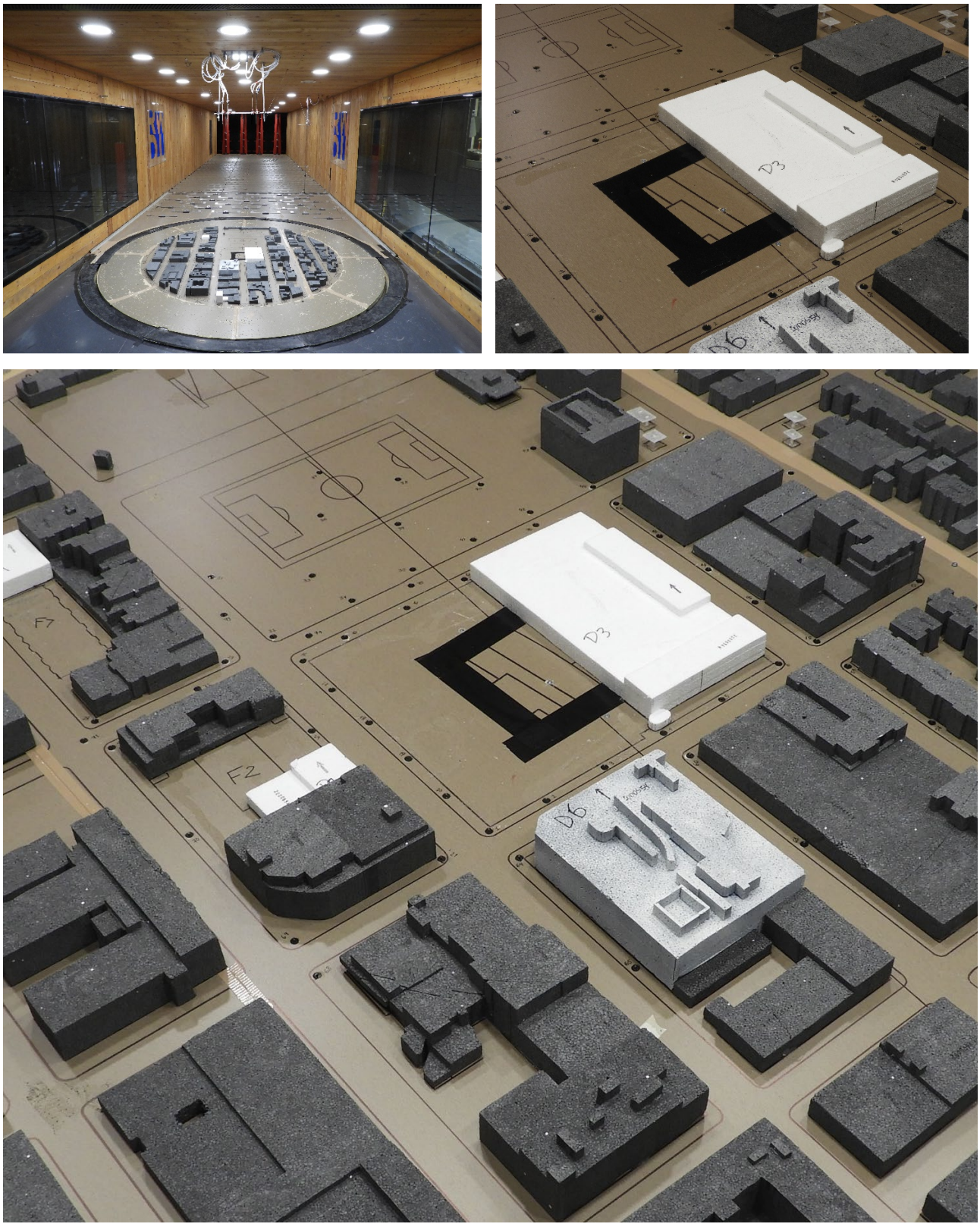


Image 2A: Wind Tunnel Study Model – Existing Configuration

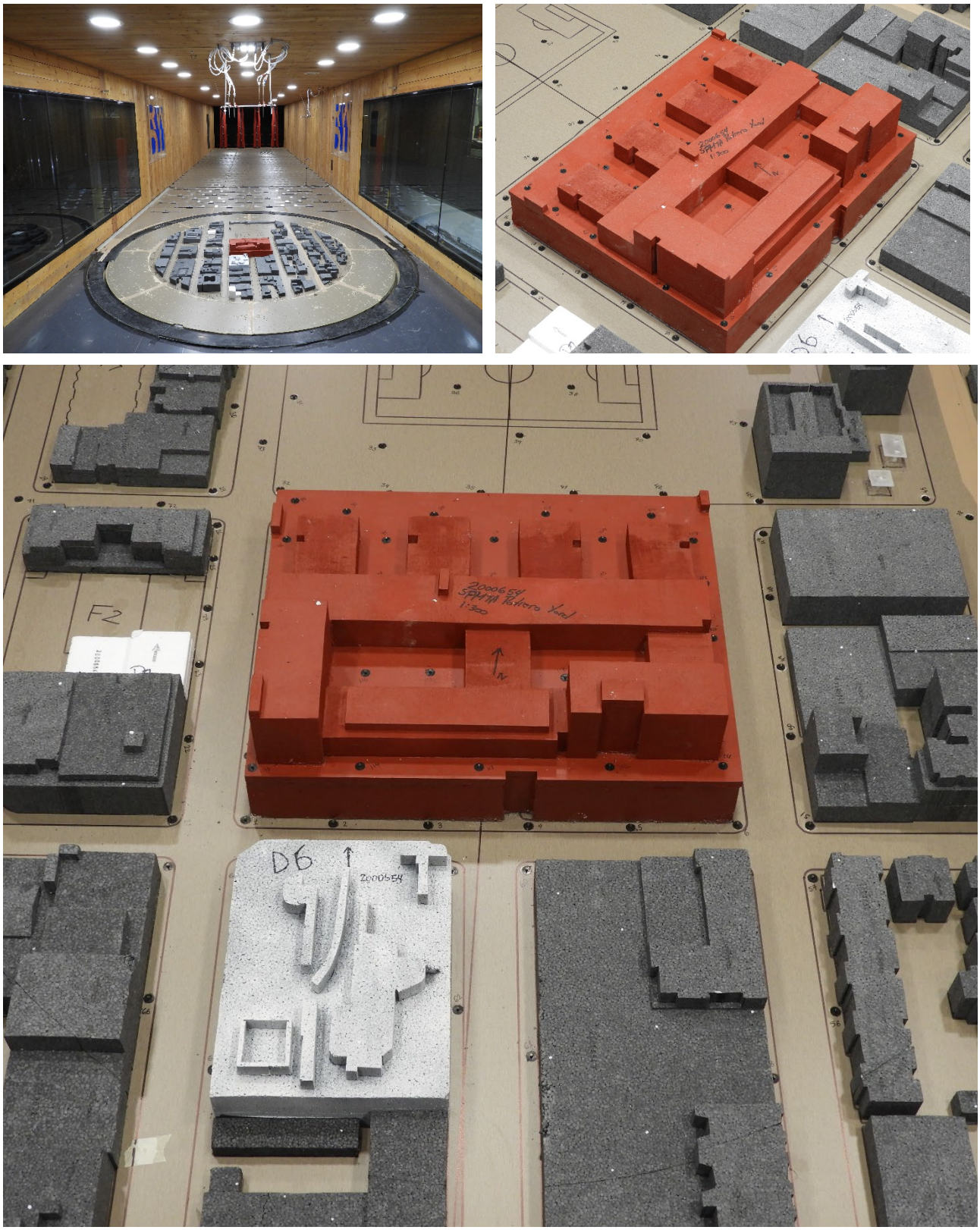


Image 2B: Wind Tunnel Study Model – Existing + Project Configuration

Image 2C: Wind Tunnel Study Model – Project + Cumulative Configuration

Meteorological Data

Data describing the speed, direction and frequency of occurrence of winds were gathered at the old San Francisco Federal Building at 50 United Nations Plaza (at a height of 132 ft.) during the six-year period, 1945 to 1951. Average wind speeds in San Francisco are the highest in the summer and lowest in winter. However, the strongest peak winds occur in winter. Throughout the year the highest wind speeds occur in mid-afternoon and the lowest in the early morning. Westerly to northwesterly winds are the most frequent and strongest winds during all seasons. Of the primary wind directions, four have the greatest frequency of occurrence and make up the majority of the strong winds that occur. These winds include the northwest, west-northwest, west and west-southwest.

Wind statistics were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared against the criteria for wind comfort and hazard as started in the San Francisco Planning Code Section 148.

Planning Code Requirements

This project is located in an area that is subject to the San Francisco Planning Code Section 148, Reduction of Ground-level Wind Currents in C-3 Districts. The Planning Code specifically outlines wind reduction criteria for the C-3 District. This analysis is performed using the wind testing analysis and evaluation methods to determine conformity with the Code. These requirements are described in Planning Code Section 148 (see ***Appendix A***).

The comfort criteria are that wind speeds will not exceed, more than 10% of the time, 11 mph in substantial pedestrian use areas, and 7 mph in public seating areas. Similarly, the hazard criterion of the Code requires that buildings not cause equivalent wind speeds to reach or exceed the hazard level of 26 mph as averaged from a single full hour of the year. The hazard criterion is based on winds that are measured for one hour and averaged, corresponding to a one-minute average of 36 mph.

The Planning Code defines these wind speeds in terms of equivalent wind speeds, and they are calculated according to the specifications in the San Francisco Planning Code Section 148, whereby the mean hourly wind speed is increased when the turbulence intensity is greater than 15% according to the following formula:

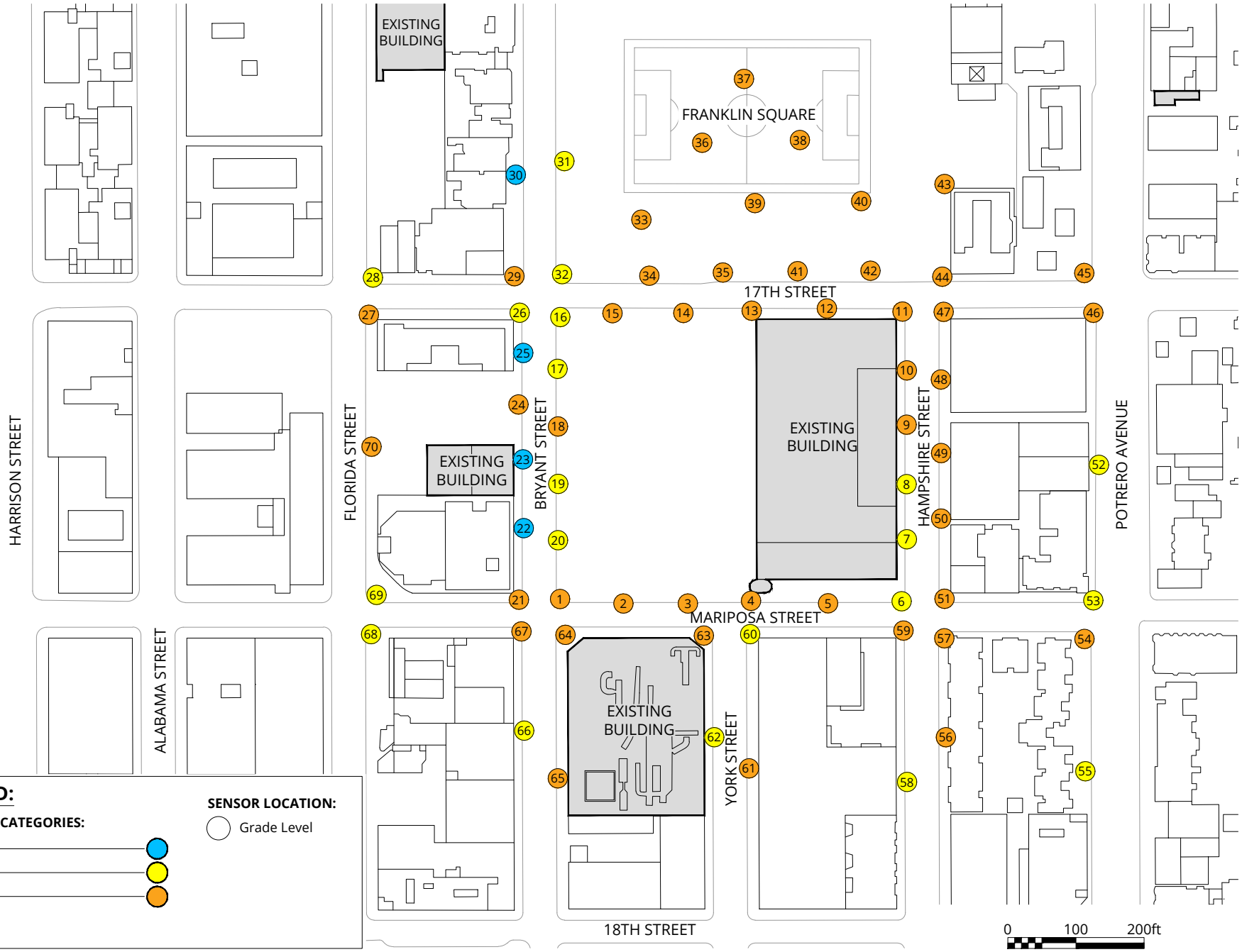
$$\boldsymbol{EWS} = \boldsymbol{V_m} \times (\mathbf{2} \times \boldsymbol{TI} + \mathbf{0.7})$$

Where: $\boldsymbol{EWS}$ = equivalent wind speed

$\boldsymbol{V_m}$ = mean pedestrian − level wind speed

$\boldsymbol{TI}$ = turbulence intensity.

FIGURES



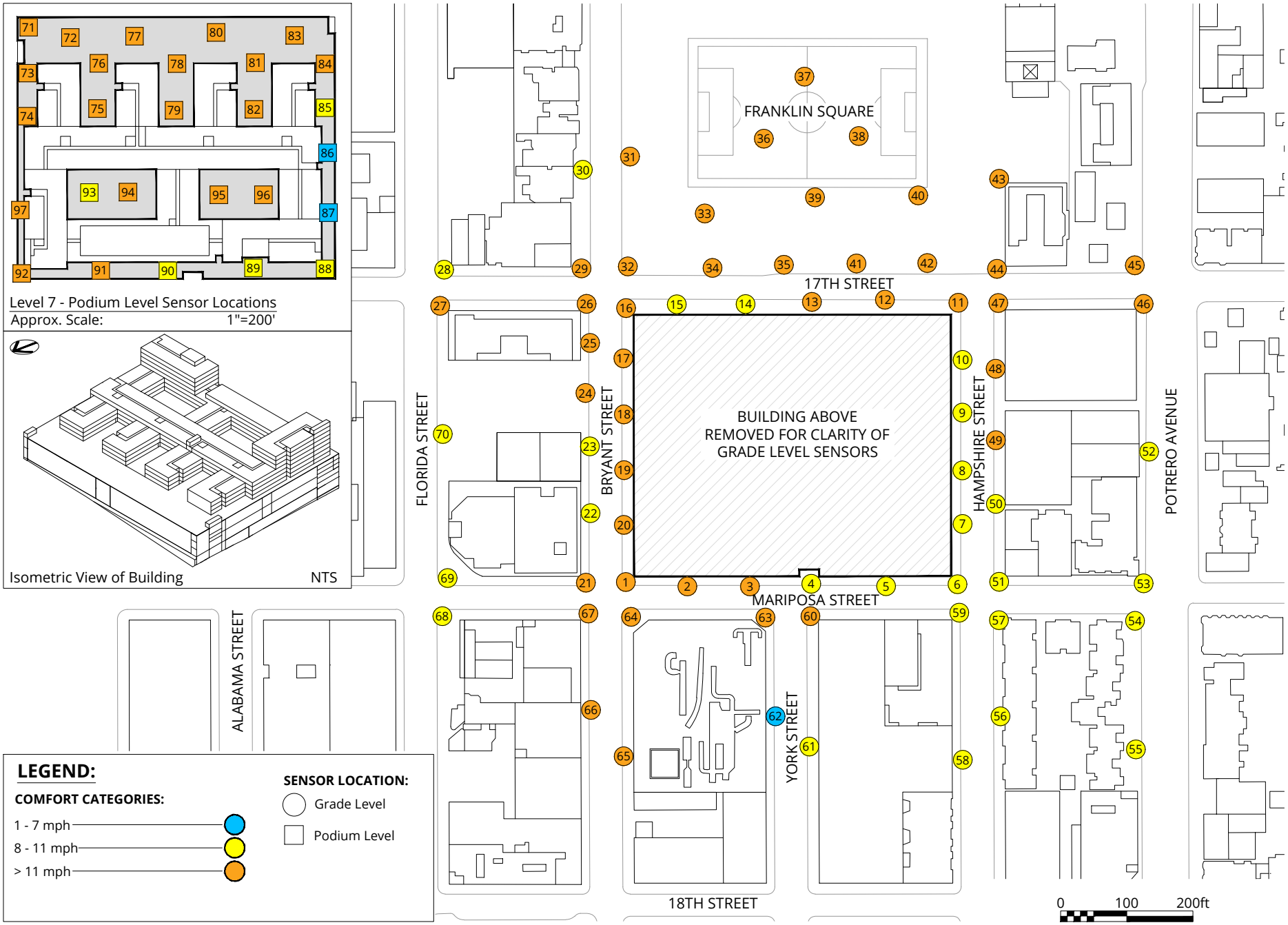
Pedestrian Wind Comfort Conditions
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by:	DF	Figure:	1A
Approx. Scale:	1"=200'		
Date Revised:	Feb. 21, 2020		



Pedestrian Wind Comfort Conditions

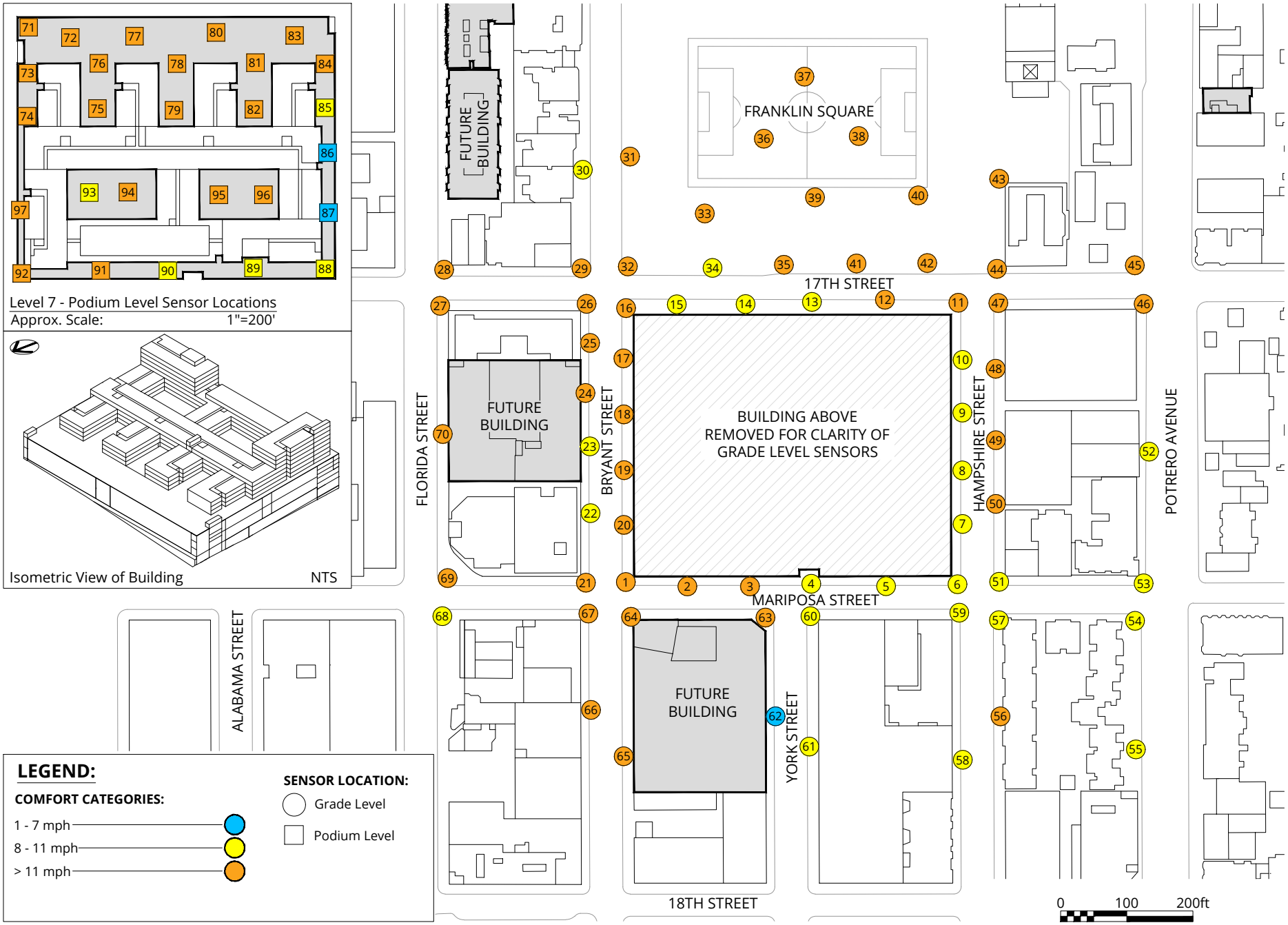
Existing + Project
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by:	DF	Figure:	1B
Approx. Scale:	1"=200'		
Date Revised:	Mar. 4, 2020		



Pedestrian Wind Comfort Conditions

Project + Cumulative

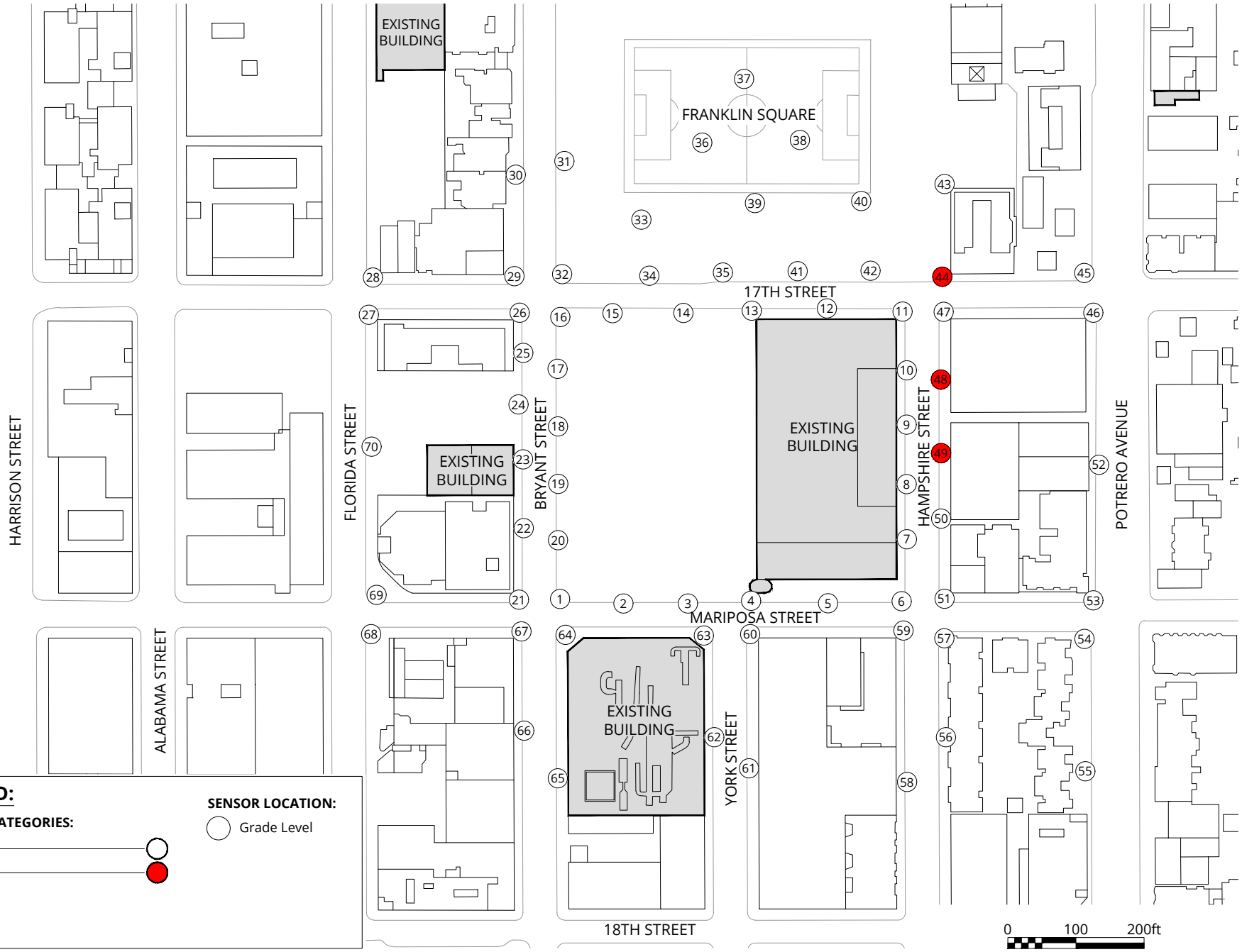
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by:	DF	Figure:	1C
Approx. Scale:	1"=200'		
Date Revised:	Mar. 4, 2020		



LEGEND:

HAZARD CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

Pedestrian Wind Hazard Conditions

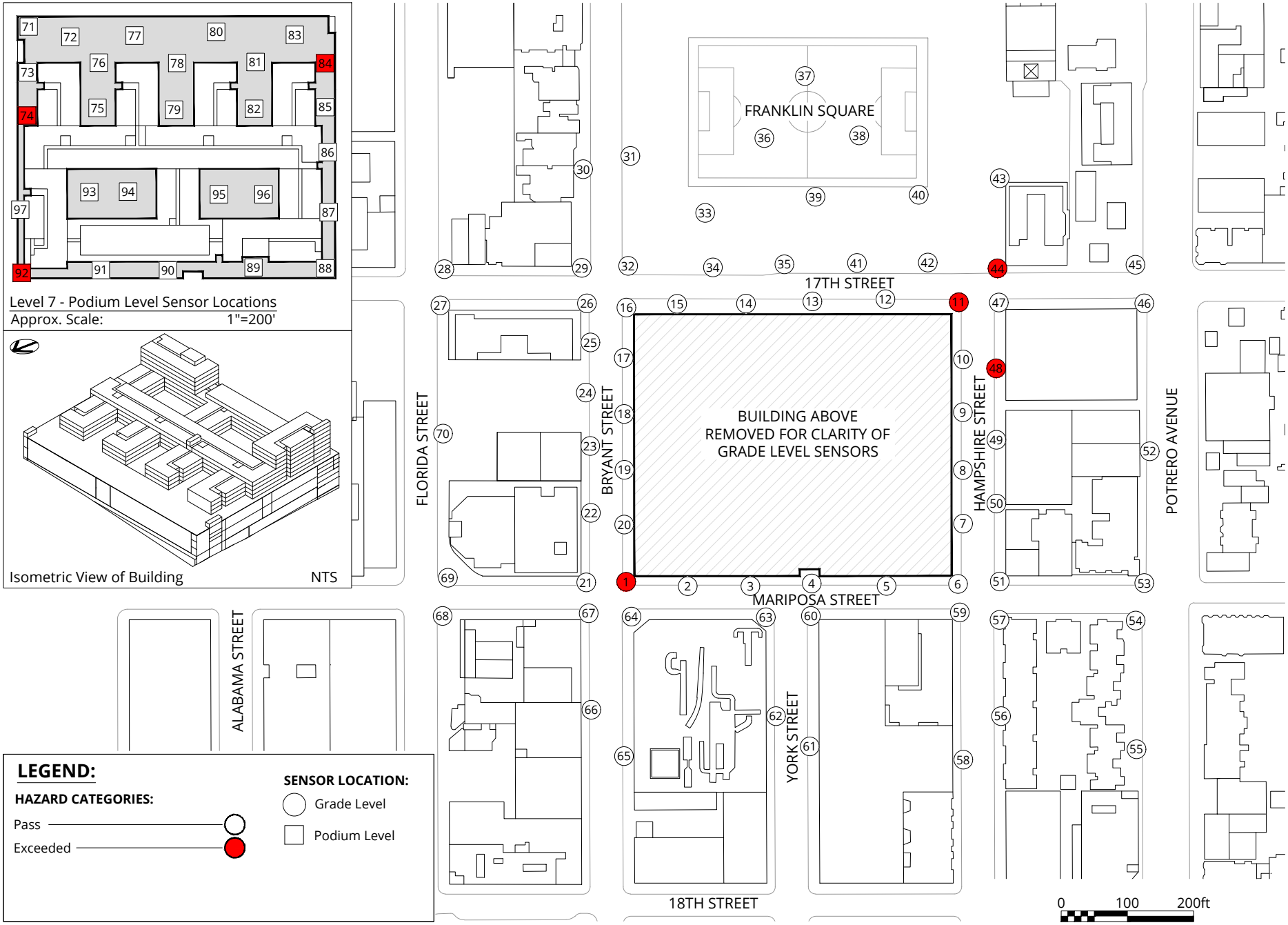
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: DF	Figure: 2A
Approx. Scale:	1"=200'
Date Revised:	Feb. 21, 2020



Pedestrian Wind Hazard Conditions

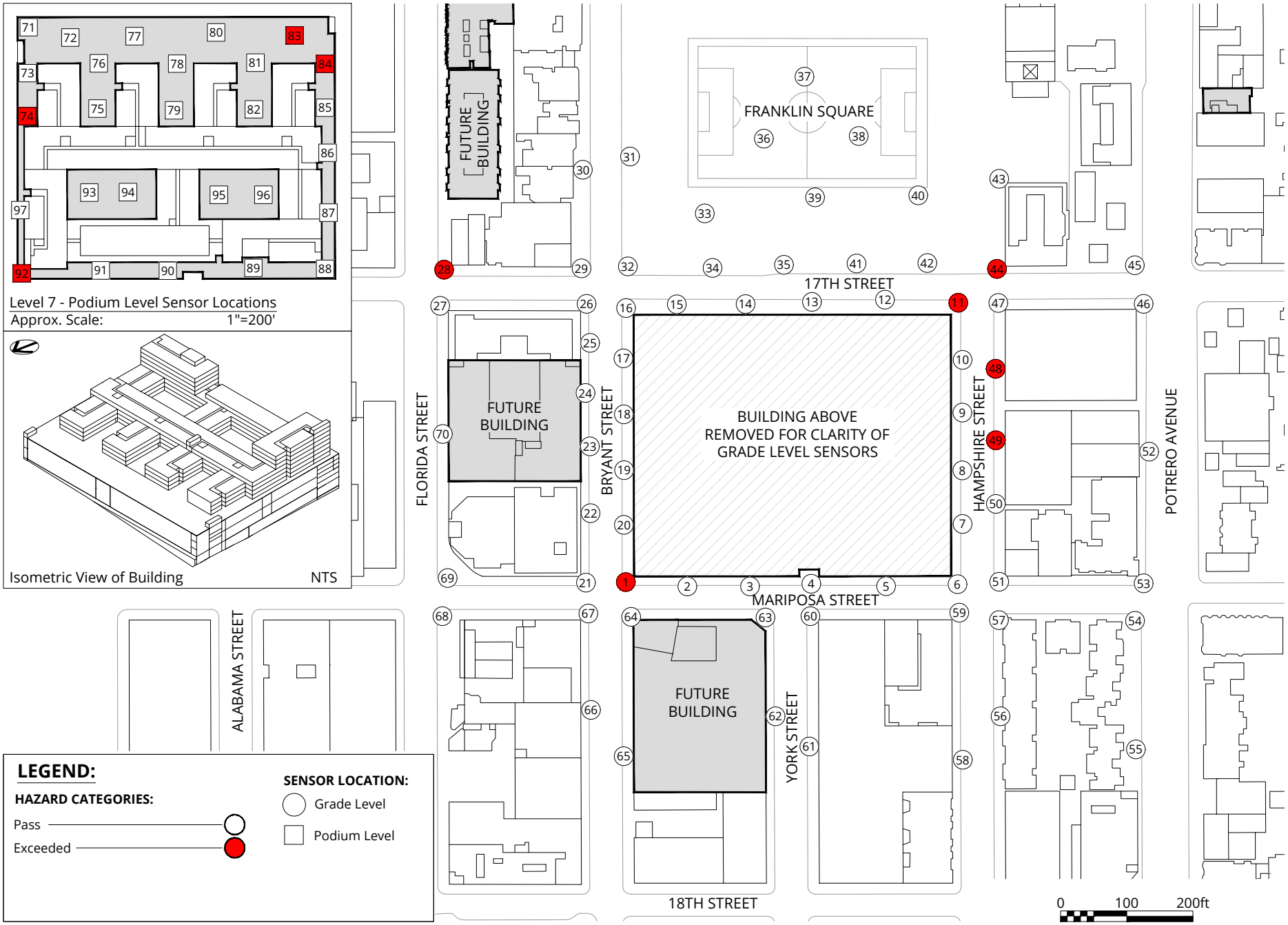
Existing + Project
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by:	DF	Figure:	2B
Approx. Scale:	1"=200'		
Date Revised:	Mar. 4, 2020		



Pedestrian Wind Hazard Conditions

Project + Cumulative

Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: DF	Figure: 2C	
Approx. Scale: 1"=200'		
Date Revised: Mar. 4, 2020		

TABLES

Table 1.1: Wind Comfort Conditions - Grade Level

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
1	13	20	e	21	50	8	e	19	40	6	e
2	13	19	e	16	28	3	e	17	32	4	e
3	13	15	e	13	19	0	e	13	18	0	e
4	13	20	e	9	5	-4		9	4	-4	
5	12	14	e	9	3	-3		9	4	-3	
6	10	7		8	3	-2		8	3	-2	
7	10	6		11	10	1		11	10	1	
8	11	10		11	10	0		11	10	0	
9	13	19	e	9	3	-4		9	4	-4	
10	15	25	e	8	2	-7		9	3	-6	
11	17	33	e	19	38	2	e	19	37	2	e
12	13	14	e	15	22	2	e	14	16	1	e
13	14	25	e	12	14	-2	e	11	10	-3	
14	14	19	e	11	10	-3		9	7	-5	
15	12	15	e	10	7	-2		9	4	-3	
16	10	5		19	43	9	e	16	31	6	e
17	9	4		15	26	6	e	14	22	5	e
18	12	13	e	13	21	1	e	15	28	3	e
19	11	10		13	16	2	e	13	21	2	e
20	10	6		15	24	5	e	12	13	2	e
21	13	20	e	16	31	3	e	16	31	3	e
22	6	1		11	10	5		10	8	4	
23	7	1		11	10	4		11	10	4	
24	13	17	e	16	33	3	e	13	17	0	e
25	6	0		12	16	6	e	13	18	7	e
26	11	10		12	15	1	e	13	18	2	e
27	14	23	e	14	21	0	e	16	30	2	e
28	10	4		10	4	0		18	34	8	e
29	12	13	e	13	17	1	e	14	22	2	e
30	6	0		10	7	4		9	2	3	
31	11	10		13	19	2	e	12	14	1	e
32	11	10		16	31	5	e	14	23	3	e
33	13	18	e	14	24	1	e	12	15	-1	e
34	13	18	e	13	20	0	e	11	10	-2	
35	14	21	e	14	23	0	e	13	16	-1	e
36	14	22	e	14	25	0	e	13	20	-1	e
37	15	25	e	14	22	-1	e	14	21	-1	e
38	16	29	e	15	28	-1	e	15	25	-1	e
39	14	23	e	14	23	0	e	13	20	-1	e
40	14	23	e	14	21	0	e	14	20	0	e
41	14	22	e	14	22	0	e	14	21	0	e
42	14	21	e	14	22	0	e	14	22	0	e
43	17	38	e	17	36	0	e	17	35	0	e
44	23	53	e	22	52	-1	e	22	51	-1	e
45	15	25	e	14	22	-1	e	13	20	-2	e
46	16	30	e	15	26	-1	e	16	30	0	e
47	17	36	e	16	29	-1	e	17	33	0	e

Table 1.1: Wind Comfort Conditions - Grade Level

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											

Summary	Average (mph)	Average (%)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total
	13	18	46 ---- 70	13	18	0	42 ---- 70	13	18	0	44 ---- 70

Table 1.2: Wind Comfort Conditions - Podium Level

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
71											
72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
87											
88											
89											
90											
91											
92											
93											
94											
95											
96											
97											

Summary	Average (mph)	Average (%)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total
	-	-	-	15	28	-	20 ---- 27	15	27	-	20 ---- 27

Table 2.1: Wind Hazard Conditions - Grade Level

Location	Existing			Existing + Project				Project + Cumulative			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
1	24	0		42	18	18	e	36	1	1	e
2	26	0		29	0	0		33	0	0	
3	25	0		28	0	0		26	0	0	
4	25	0		20	0	0		19	0	0	
5	24	0		18	0	0		18	0	0	
6	19	0		19	0	0		19	0	0	
7	20	0		20	0	0		21	0	0	
8	21	0		21	0	0		22	0	0	
9	25	0		16	0	0		18	0	0	
10	29	0		16	0	0		17	0	0	
11	35	0		37	2	2	e	38	5	5	e
12	27	0		30	0	0		30	0	0	
13	28	0		26	0	0		24	0	0	
14	27	0		25	0	0		21	0	0	
15	24	0		19	0	0		17	0	0	
16	17	0		35	0	0		30	0	0	
17	21	0		28	0	0		26	0	0	
18	24	0		25	0	0		28	0	0	
19	22	0		27	0	0		25	0	0	
20	23	0		31	0	0		26	0	0	
21	24	0		33	0	0		31	0	0	
22	14	0		22	0	0		20	0	0	
23	17	0		21	0	0		21	0	0	
24	24	0		30	0	0		23	0	0	
25	10	0		23	0	0		24	0	0	
26	19	0		23	0	0		24	0	0	
27	25	0		24	0	0		31	0	0	
28	19	0		18	0	0		39	5	5	e
29	21	0		23	0	0		24	0	0	
30	10	0		20	0	0		18	0	0	
31	23	0		23	0	0		23	0	0	
32	20	0		31	0	0		27	0	0	
33	25	0		25	0	0		22	0	0	
34	25	0		24	0	0		24	0	0	
35	26	0		26	0	0		26	0	0	
36	26	0		25	0	0		26	0	0	
37	30	0		28	0	0		27	0	0	
38	30	0		29	0	0		29	0	0	
39	27	0		26	0	0		26	0	0	
40	28	0		26	0	0		27	0	0	
41	26	0		27	0	0		27	0	0	
42	27	0		27	0	0		28	0	0	
43	32	0		29	0	0		31	0	0	
44	47	55	e	45	36	-19	e	45	34	-21	e
45	31	0		28	0	0		25	0	0	
46	35	0		30	0	0		33	0	0	
47	33	0		31	0	0		32	0	0	

Table 2.1: Wind Hazard Conditions - Grade Level

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											

Summary	Average (mph)	Total Hours	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total
	25	58	3 ---- 70	25	86	28	4 ---- 70	25	76	18	6 ---- 70

Table 2.2: Wind Hazard Conditions - Podium Level

Location				Existing + Project				Project + Cumulative			
				Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
71											
72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
87											
88											
89											
90											
91											
92											
93											
94											
95											
96											
97											

Summary	Average (mph)	Total Hours	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total
	-	-	-	29	99	-	3 ---- 27	29	75	-	4 ---- 27

APPENDIX B2

PRELIMINARY RESULTS

SFMTA POTRERO YARD

SAN FRANCISCO, CA

PEDESTRIAN WIND STUDY
RWDI # 2000654
May 25, 2020

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed SFMTA Potrero Yards in San Francisco, CA (Image 1). RWDI conducted an initial wind tunnel testing of the Existing, Existing + Proposed and Proposed + Cumulative configurations in February 2020. Based on our initial wind-tunnel testing, RWDI developed some wind control measures for the identified windy areas in conjunction with the design team and the San Francisco Planning Department. Two mitigation options were tested recently, together with a revised Existing configuration. Following is a description of four configurations presented in this report:

A. Existing	Existing site and surroundings with existing landscaping and localized contouring around Franklin Square (tested in May 2020)
B. Existing + Project	Proposed project with existing surroundings, but without any landscaping (tested in February 2020, but presented here again for comparison purpose only)
D. Option 1	Proposed project with existing surroundings and landscaping, including the following wind control measures: • 10ft deep solid canopy at the southwest corner of the project • 10 x10 ft. recess at the southwest corner Proposed landscaping on-site
E. Option 2	Proposed project with existing surroundings and landscaping, including the following wind control measures: • 10ft deep solid canopy at the southwest corner of the project • 15 x 20 ft. recess at the southwest corner Proposed landscaping on-site

The potential wind comfort and hazard conditions are shown in a site plan in Figures 1A through 2E and the associated wind comfort and wind hazard speeds are listed in Tables 1 and Table 2 respectively.

Image 2A: Wind Tunnel Study Model – Existing Configuration

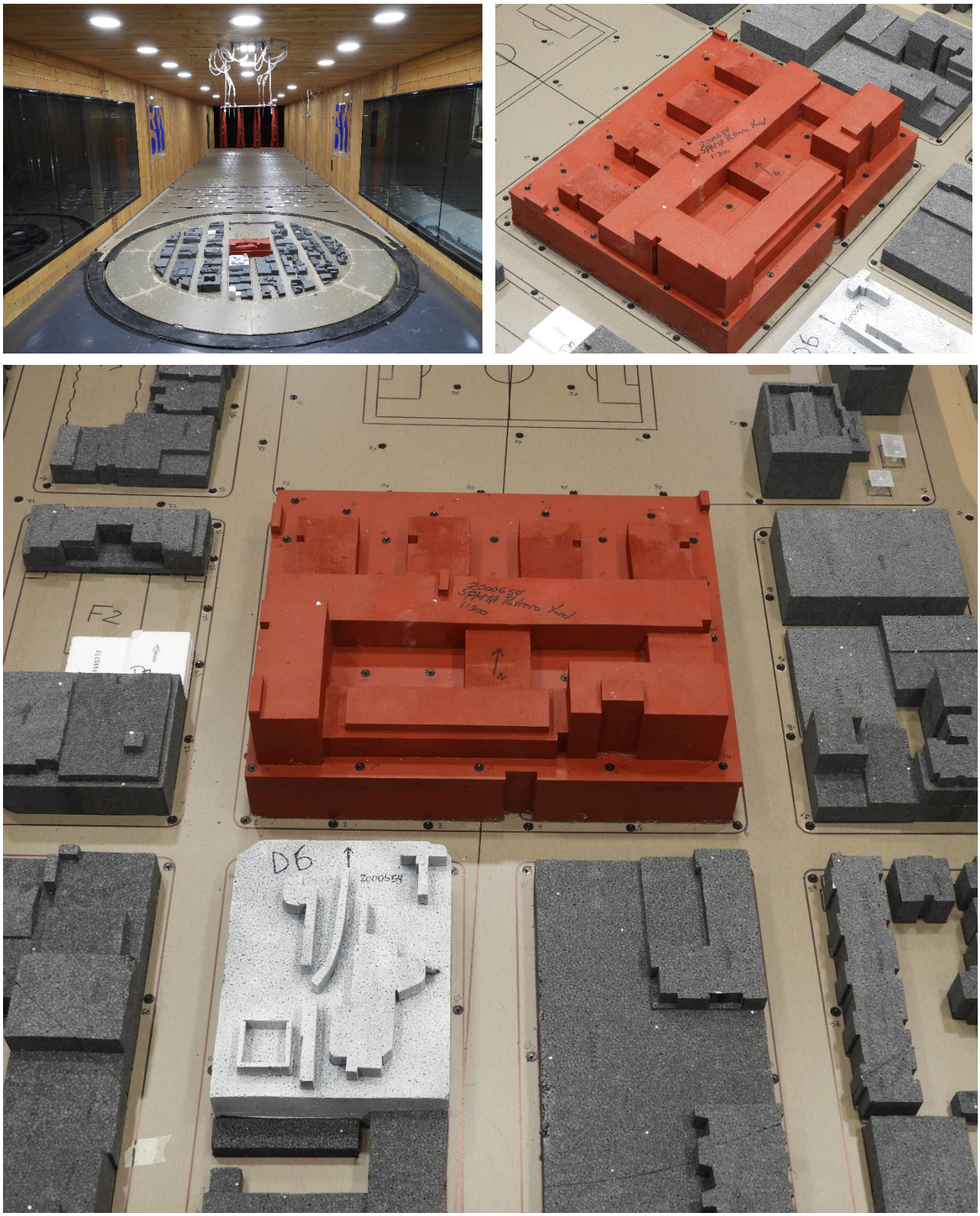


Image 2B: Wind Tunnel Study Model – Existing + Project Configuration

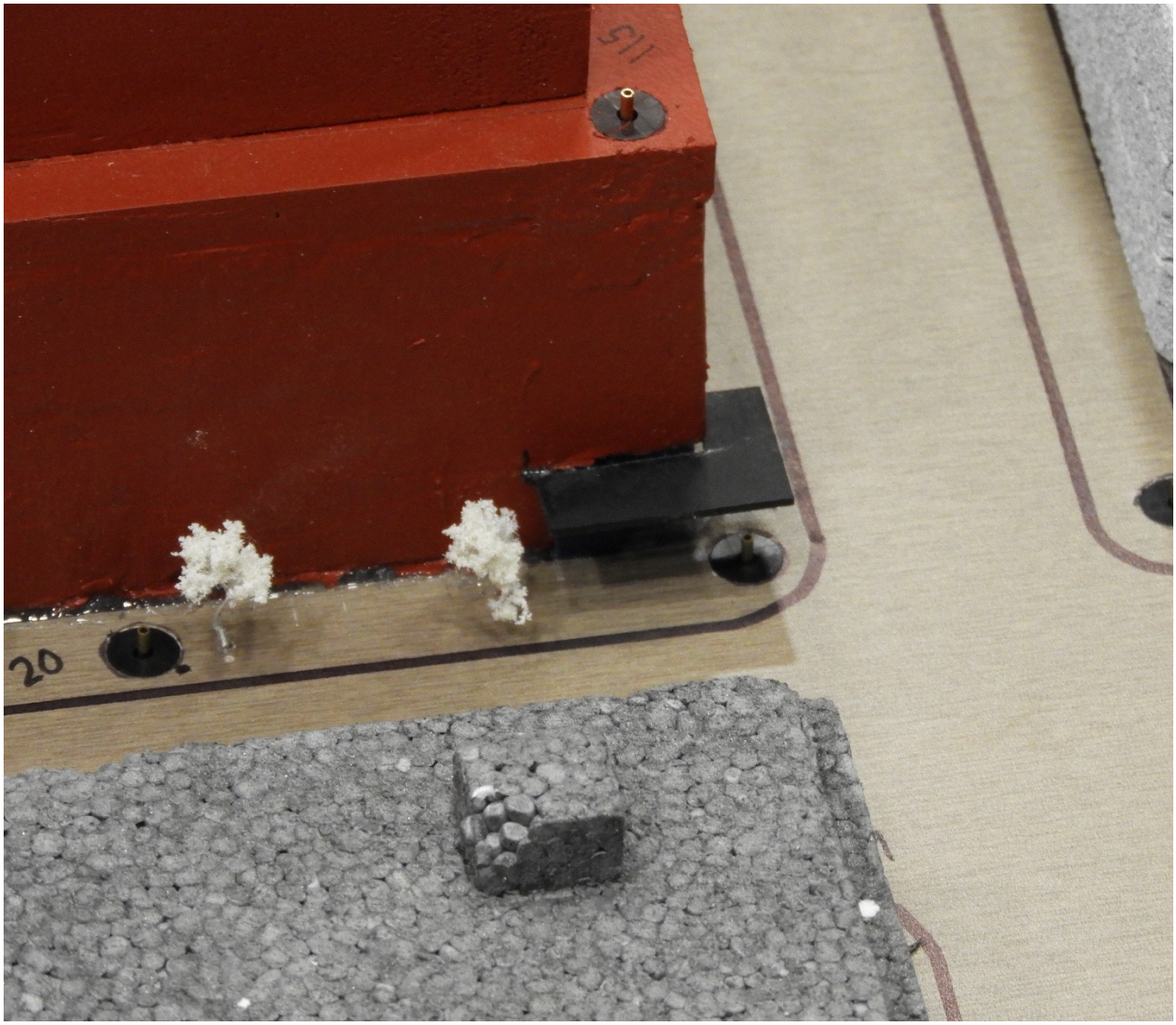


Image 2D: Wind Tunnel Study Model – Option 1 Configuration

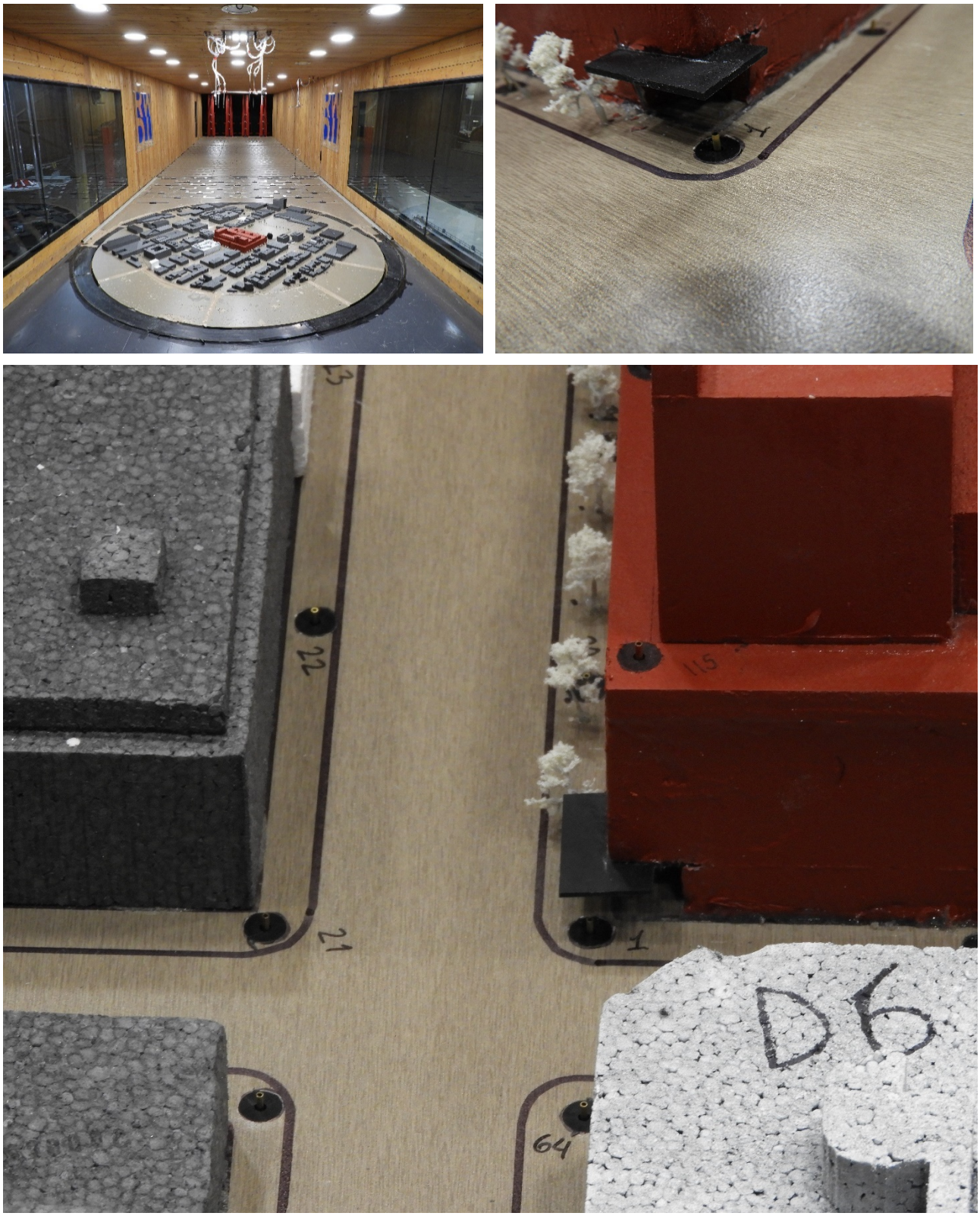
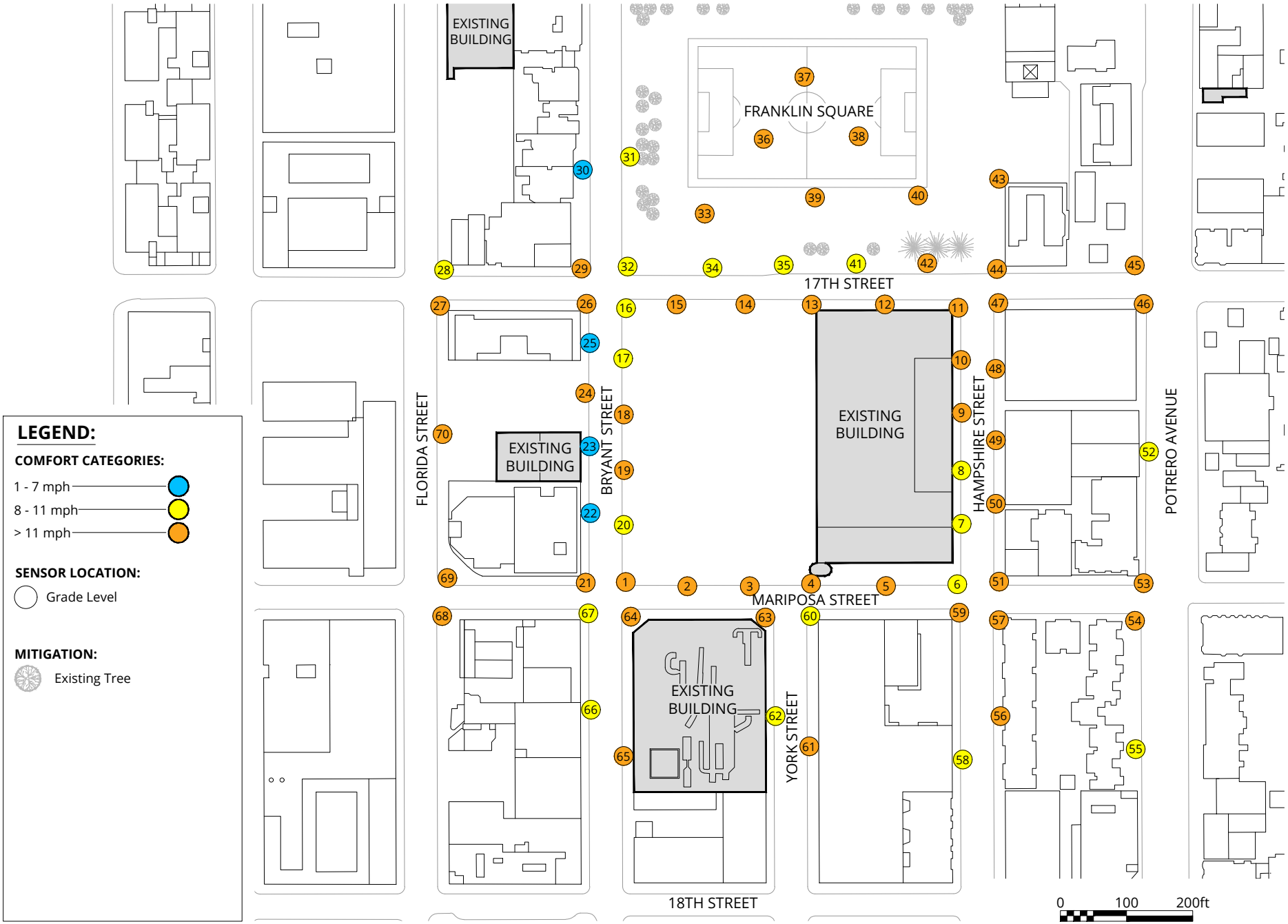


Image 2E: Wind Tunnel Study Model – Option 2 Configuration

FIGURES



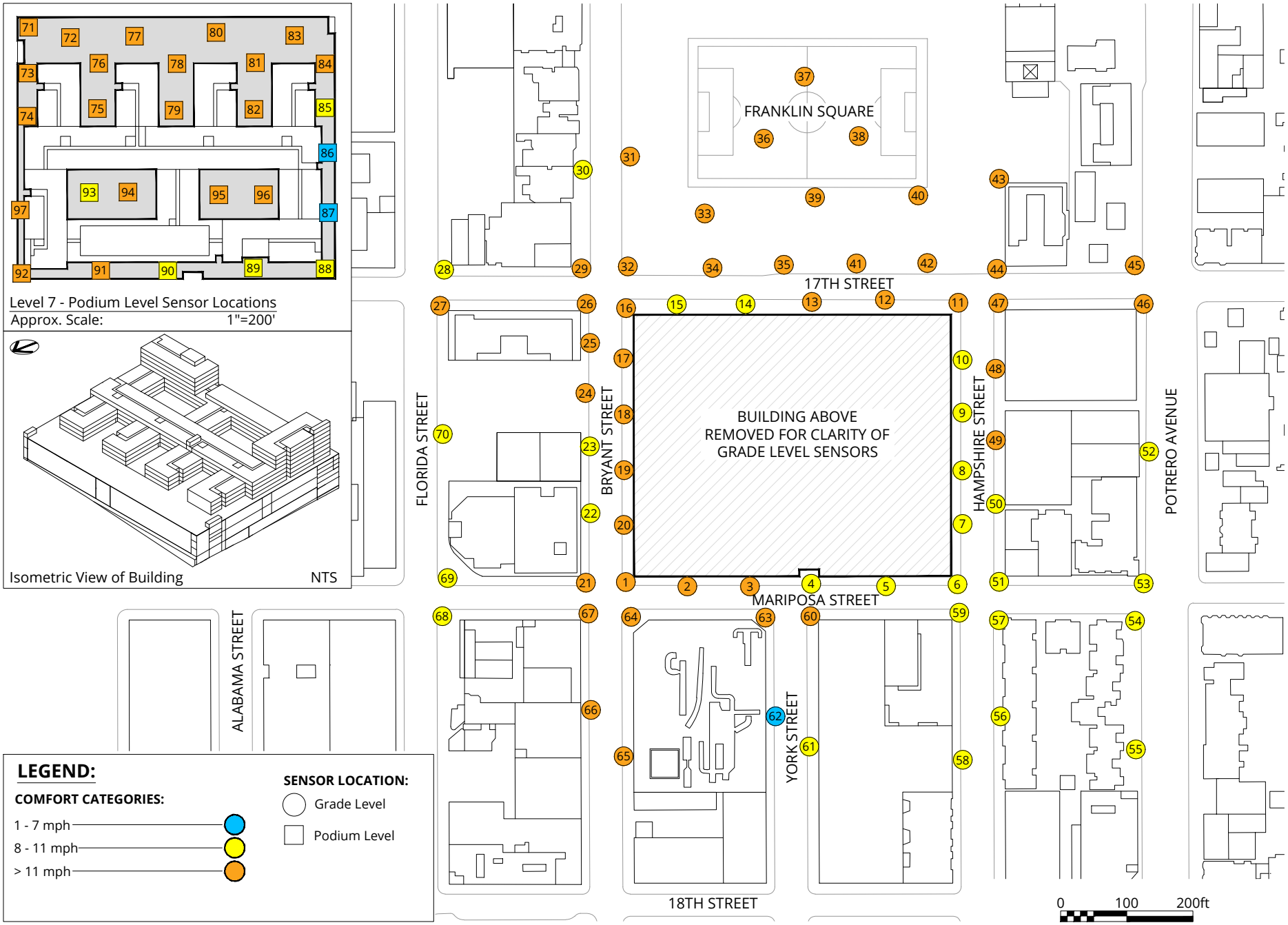
Pedestrian Wind Comfort Conditions
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1A
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Pedestrian Wind Comfort Conditions

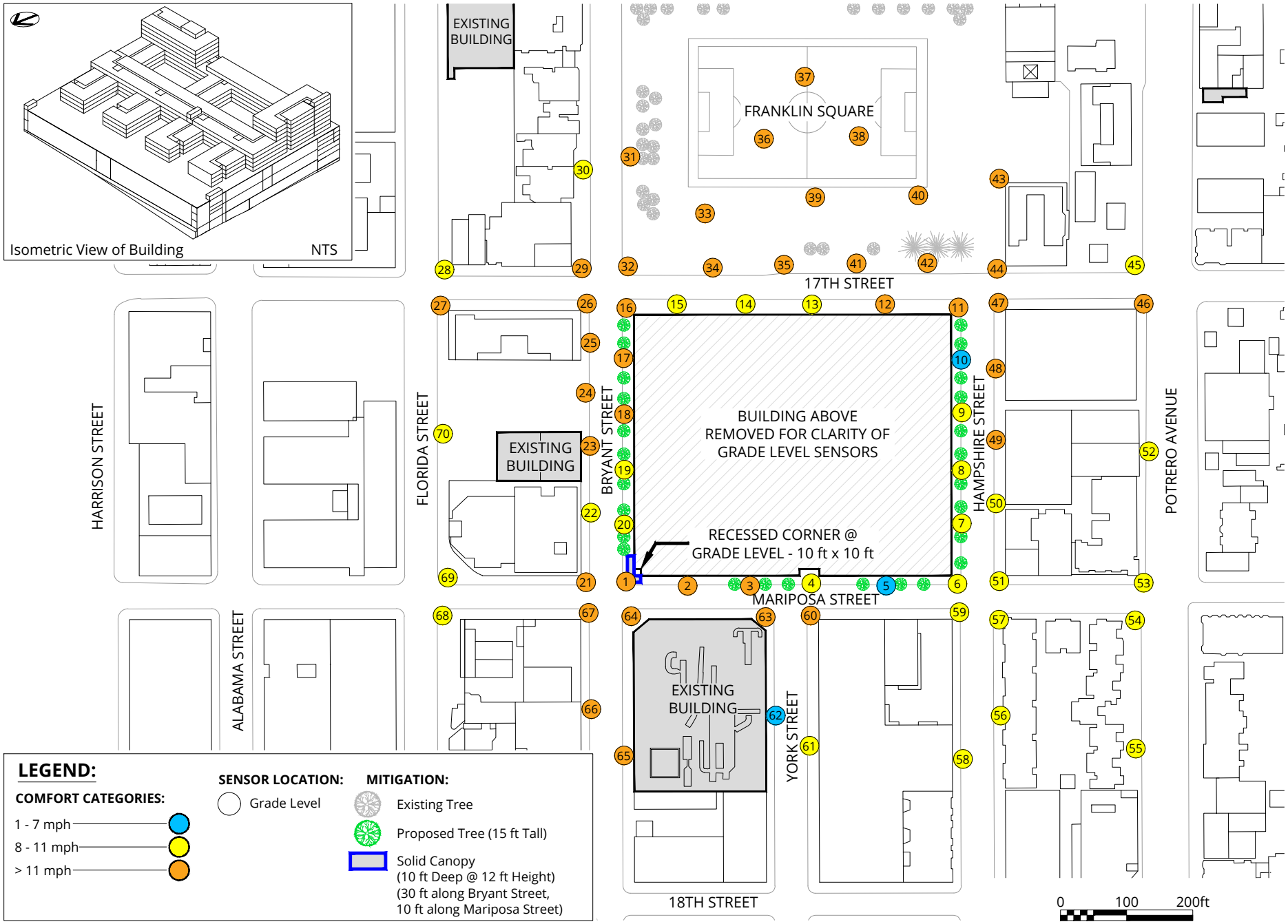
Existing + Project
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by:	DF	Figure:	1B
Approx. Scale:	1"=200'		
Date Revised:	Mar. 4, 2020		



Pedestrian Wind Comfort Conditions

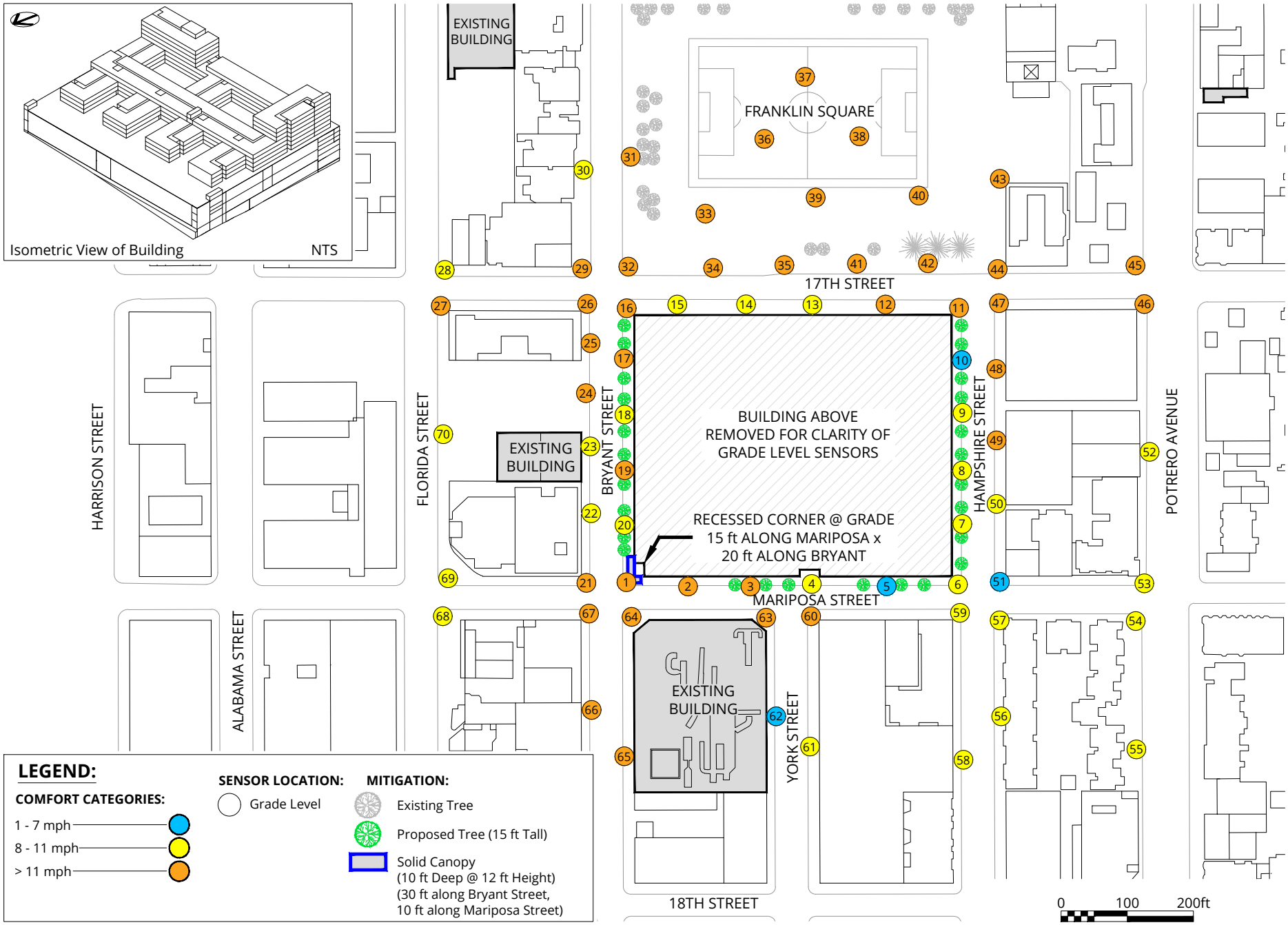
Option 1
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1D
Approx. Scale:	1"=200'
Date Revised:	May 21, 2020



Pedestrian Wind Comfort Conditions

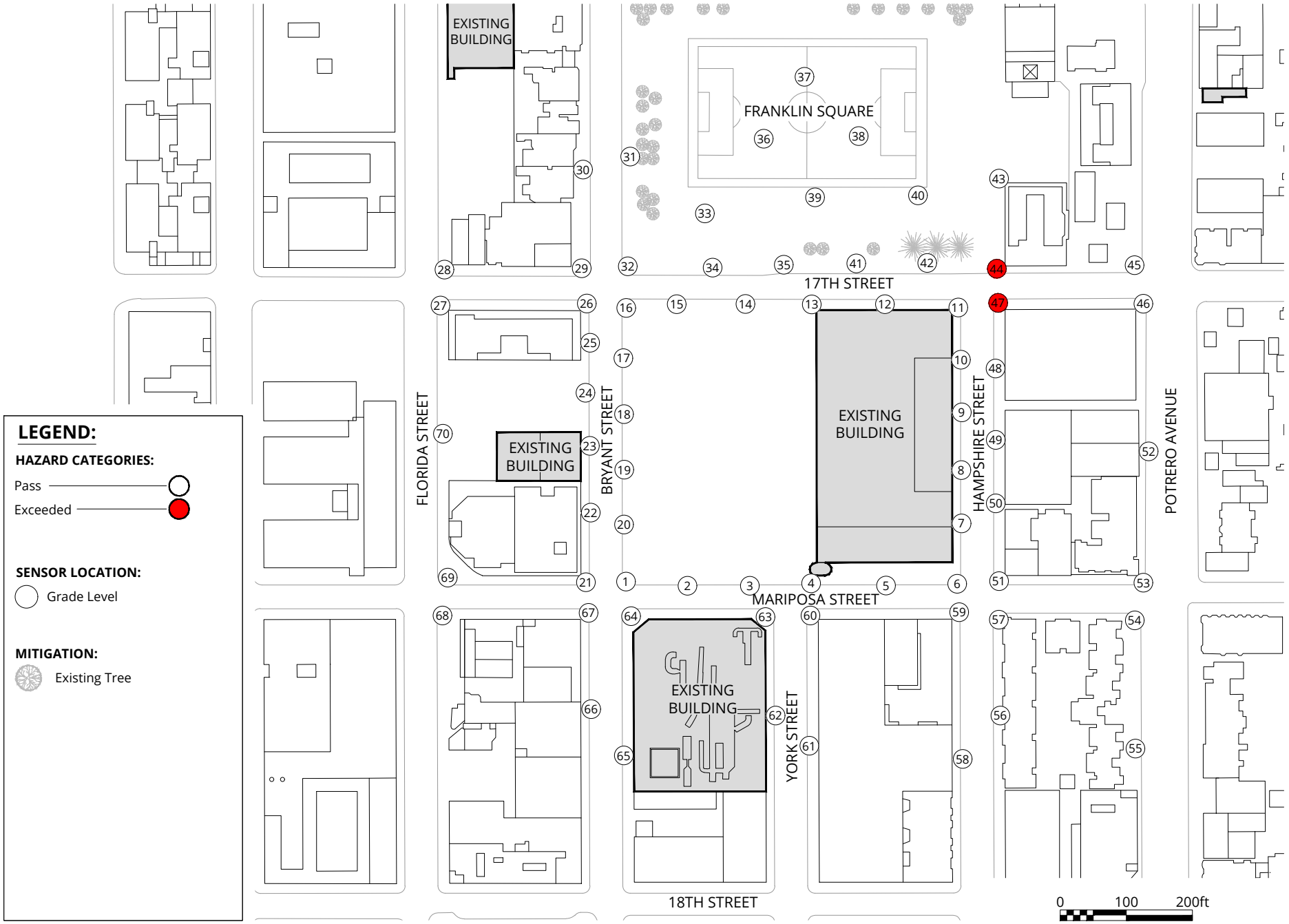
Option 2
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1E
Approx. Scale:	1"=200'
Date Revised:	May 21, 2020



LEGEND:

HAZARD CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

MITIGATION:

Existing Tree

Pedestrian Wind Hazard Conditions

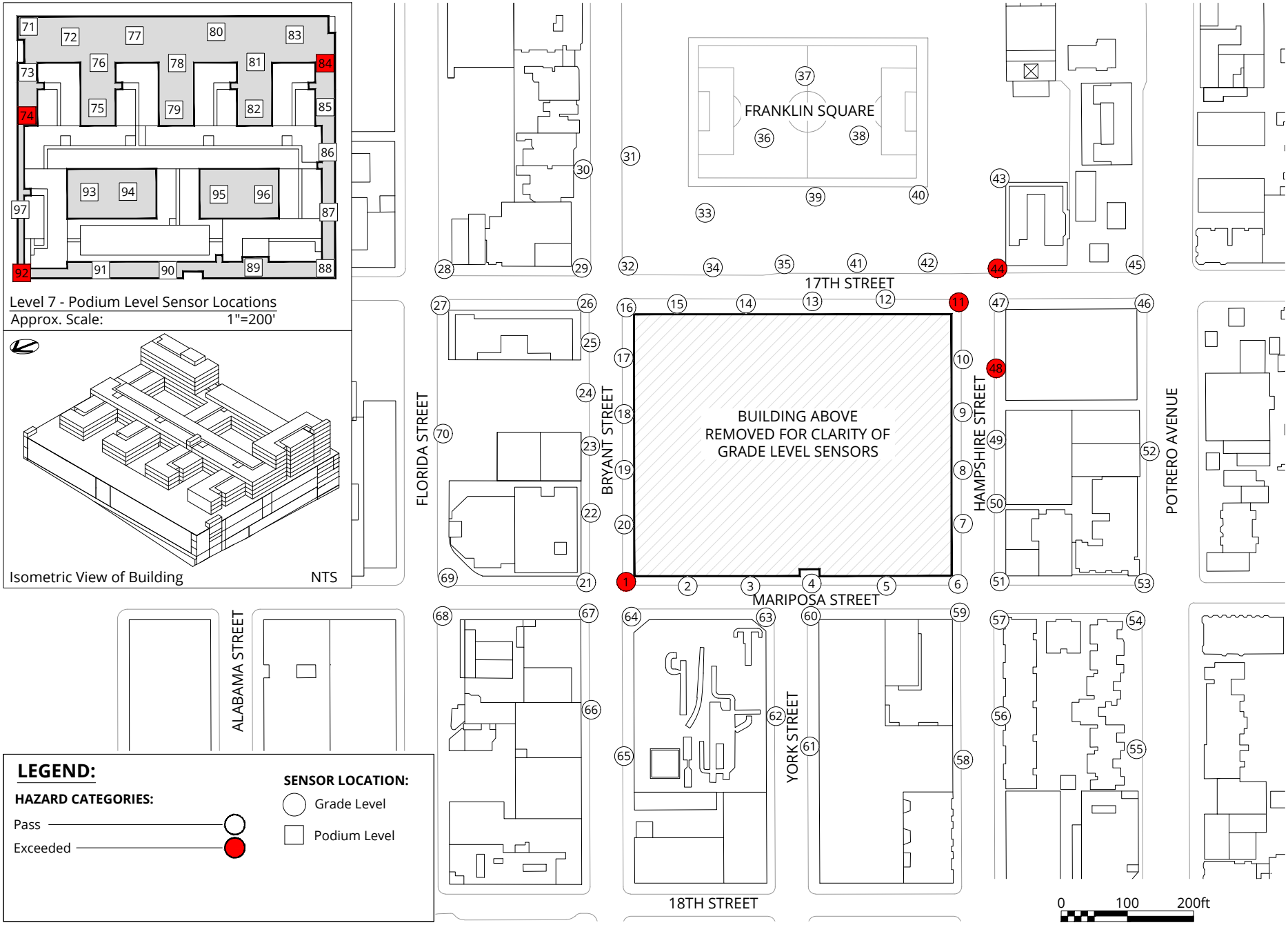
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2A
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



Pedestrian Wind Hazard Conditions

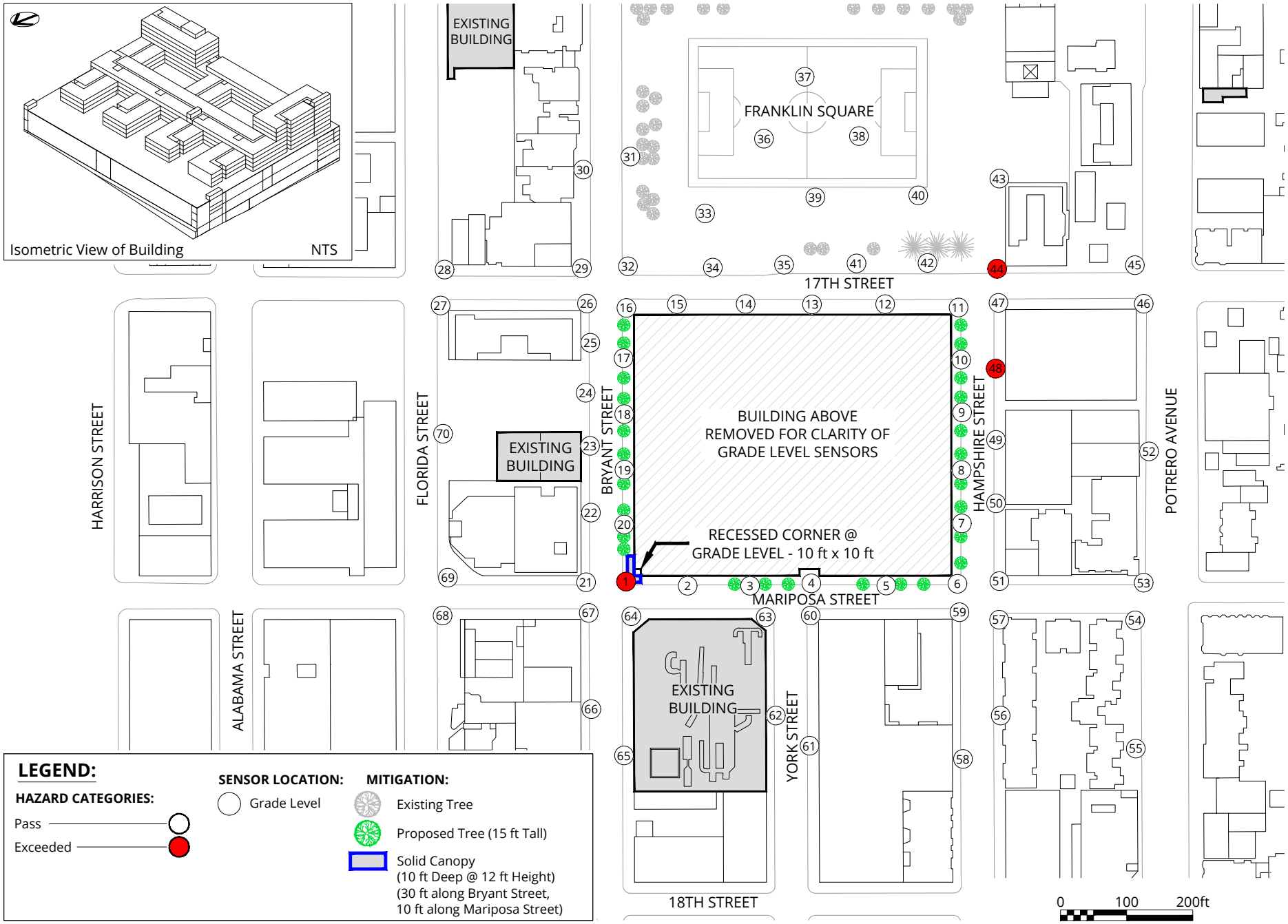
Existing + Project
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by:	DF	Figure:	2B
Approx. Scale:	1"=200'		
Date Revised:	Mar. 4, 2020		



Pedestrian Wind Hazard Conditions

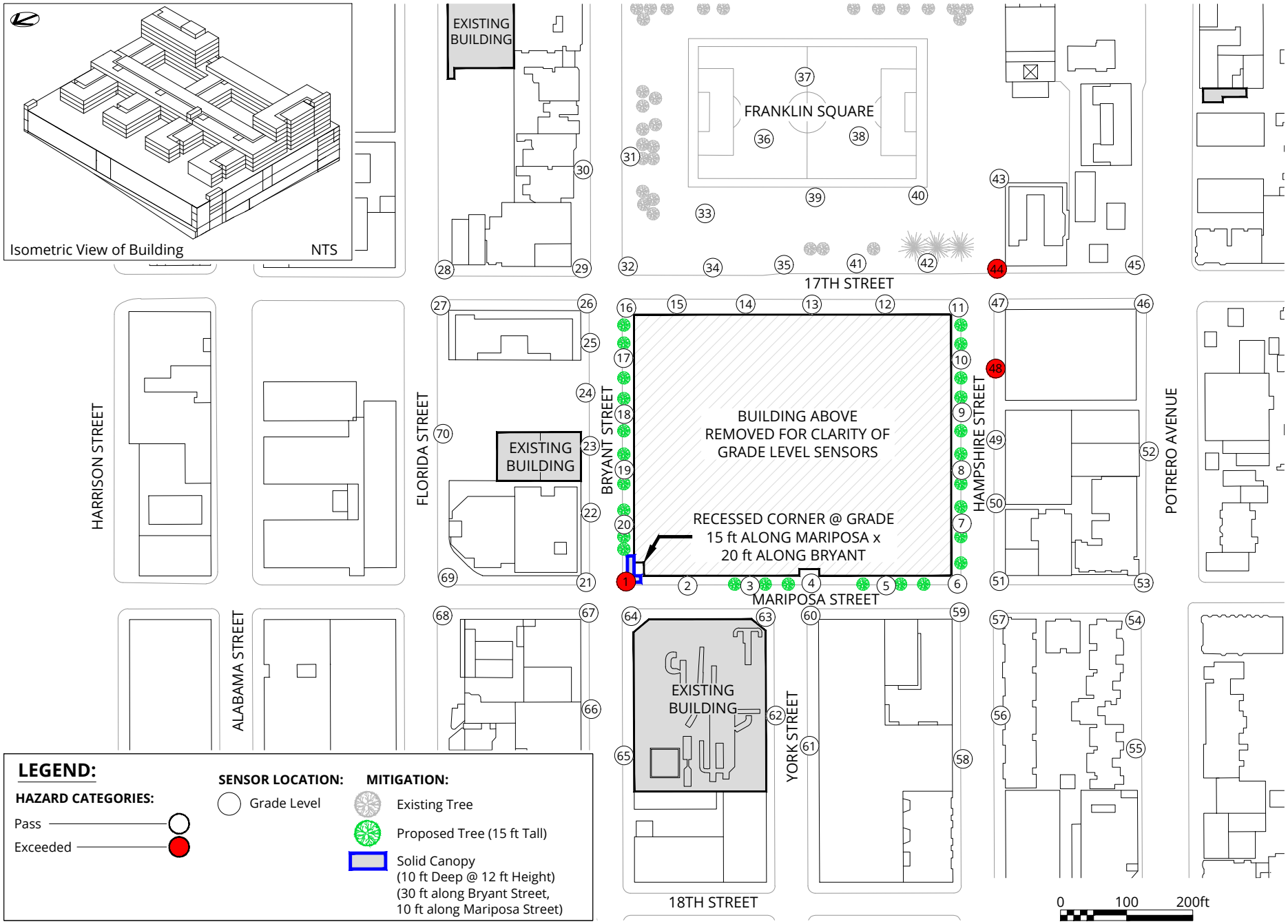
Option 1
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2D
Approx. Scale:	1"=200'
Date Revised:	May 21, 2020



Pedestrian Wind Hazard Conditions

Option 2
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2E
Approx. Scale:	1"=200'
Date Revised:	May 21, 2020

TABLES

Table 1: Wind Comfort Conditions

Location	Existing			Existing + Project				Option 1				Option 2			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
1	12	18	e	21	50	9	e	22	51	10	e	21	51	9	e
2	12	12	e	16	28	4	e	14	22	2	e	13	20	1	e
3	12	14	e	13	19	1	e	12	15	0	e	12	13	0	e
4	12	17	e	9	5	-3		8	3	-4		8	3	-4	
5	13	15	e	9	3	-4		7	1	-6		7	1	-6	
6	11	10		8	3	-3		8	1	-3		8	1	-3	
7	10	6		11	10	1		9	3	-1		9	3	-1	
8	11	10		11	10	0		10	6	-1		10	6	-1	
9	12	13	e	9	3	-3		8	2	-4		9	2	-3	
10	14	23	e	8	2	-6		7	0	-7		7	1	-7	
11	17	32	e	19	38	2	e	16	30	-1	e	17	34	0	e
12	13	15	e	15	22	2	e	12	14	-1	e	13	16	0	e
13	14	22	e	12	14	-2	e	11	10	-3		11	10	-3	
14	13	18	e	11	10	-2		11	10	-2		10	7	-3	
15	12	13	e	10	7	-2		10	6	-2		10	6	-2	
16	10	6		19	43	9	e	17	36	7	e	17	38	7	e
17	9	4		15	26	6	e	13	19	4	e	12	15	3	e
18	13	15	e	13	21	0	e	13	17	0	e	11	10	-2	
19	13	18	e	13	16	0	e	11	10	-2		12	12	-1	e
20	10	7		15	24	5	e	11	10	1		11	10	1	
21	13	17	e	16	31	3	e	15	28	2	e	15	27	2	e
22	7	1		11	10	4		11	10	4		11	10	4	
23	7	1		11	10	4		12	15	5	e	11	10	4	
24	13	20	e	16	33	3	e	16	33	3	e	16	30	3	e
25	6	0		12	16	6	e	12	14	6	e	12	14	6	e
26	12	13	e	12	15	0	e	12	16	0	e	12	14	0	e
27	14	22	e	14	21	0	e	13	18	-1	e	13	20	-1	e
28	10	7		10	4	0		10	5	0		10	6	0	
29	12	13	e	13	17	1	e	12	17	0	e	12	17	0	e
30	6	1		10	7	4		10	7	4		10	5	4	
31	11	10		13	19	2	e	13	20	2	e	13	20	2	e
32	11	10		16	31	5	e	13	20	2	e	13	19	2	e

Table 1: Wind Comfort Conditions

Location	Existing			Existing + Project				Option 1				Option 2			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
33	13	21	e	14	24	1	e	13	21	0	e	13	21	0	e
34	11	10		13	20	2	e	12	16	1	e	12	17	1	e
35	10	7		14	23	4	e	12	14	2	e	12	14	2	e
36	13	17	e	14	25	1	e	12	17	-1	e	12	18	-1	e
37	16	30	e	14	22	-2	e	14	21	-2	e	15	25	-1	e
38	15	27	e	15	28	0	e	14	23	-1	e	14	24	-1	e
39	15	25	e	14	23	-1	e	14	23	-1	e	13	20	-2	e
40	13	20	e	14	21	1	e	12	14	-1	e	13	20	0	e
41	11	10		14	22	3	e	12	15	1	e	12	16	1	e
42	14	22	e	14	22	0	e	14	24	0	e	15	25	1	e
43	15	28	e	17	36	2	e	14	23	-1	e	14	24	-1	e
44	21	46	e	22	52	1	e	20	45	-1	e	21	50	0	e
45	15	25	e	14	22	-1	e	11	10	-4		12	16	-3	e
46	16	29	e	15	26	-1	e	13	17	-3	e	14	22	-2	e
47	19	43	e	16	29	-3	e	17	32	-2	e	18	37	-1	e
48	17	33	e	22	51	5	e	20	44	3	e	21	48	4	e
49	18	40	e	18	38	0	e	16	29	-2	e	17	32	-1	e
50	15	25	e	11	10	-4		9	3	-6		9	5	-6	
51	14	23	e	8	1	-6		8	1	-6		7	0	-7	
52	11	10		8	2	-3		8	1	-3		8	2	-3	
53	12	12	e	8	2	-4		10	4	-2		9	3	-3	
54	14	22	e	9	2	-5		9	3	-5		9	2	-5	
55	9	4		8	3	-1		8	4	-1		8	3	-1	
56	15	23	e	11	10	-4		11	10	-4		11	10	-4	
57	14	22	e	8	2	-6		8	3	-6		8	2	-6	
58	11	10		8	2	-3		8	2	-3		8	2	-3	
59	16	28	e	10	6	-6		11	10	-5		10	6	-6	
60	11	10		12	12	1	e	12	12	1	e	12	12	1	e
61	16	31	e	10	6	-6		10	7	-6		10	7	-6	
62	11	10		7	0	-4		7	1	-4		7	0	-4	
63	17	34	e	15	26	-2	e	16	28	-1	e	16	28	-1	e
64	15	26	e	18	37	3	e	16	31	1	e	15	27	0	e

Table 1: Wind Comfort Conditions

Location	Existing			Existing + Project				Option 1				Option 2			
	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds	Wind Speed Exceeded 10% of Time (mph)	% of Time Wind Speed Exceeds 11 mph (%)	Speed Change Relative to Existing (mph)	Exceeds
65	14	22	e												
66	10	6													
67	11	10													
68	13	18	e												
69	12	17	e												
70	13	19	e												

Summary	Average (mph)	Average (%)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Average (%)	Speed Change (mph)	Total
	13	**17**	**47 ---- 70**	**13**	**18**	**0**	**42 ---- 70**	**12**	**15**	**-1**	**39 ---- 70**	**12**	**15**	**-1**	**39 ---- 70**

Table 2: Wind Hazard Conditions

Location	Existing			Existing + Project				Option 1				Option 2			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
1	23	0		42	18	18	e	41	11	11	e	39	4	4	e
2	23	0		29	0	0		30	0	0		28	0	0	
3	25	0		28	0	0		27	0	0		25	0	0	
4	23	0		20	0	0		18	0	0		18	0	0	
5	24	0		18	0	0		15	0	0		14	0	0	
6	21	0		19	0	0		17	0	0		16	0	0	
7	19	0		20	0	0		16	0	0		17	0	0	
8	21	0		21	0	0		19	0	0		19	0	0	
9	22	0		16	0	0		16	0	0		16	0	0	
10	28	0		16	0	0		13	0	0		14	0	0	
11	34	0		37	2	2	e	33	0	0		35	0	0	
12	27	0		30	0	0		27	0	0		28	0	0	
13	26	0		26	0	0		24	0	0		24	0	0	
14	26	0		25	0	0		25	0	0		23	0	0	
15	23	0		19	0	0		19	0	0		19	0	0	
16	18	0		35	0	0		31	0	0		32	0	0	
17	19	0		28	0	0		24	0	0		24	0	0	
18	26	0		25	0	0		22	0	0		21	0	0	
19	26	0		27	0	0		25	0	0		26	0	0	
20	24	0		31	0	0		23	0	0		24	0	0	
21	23	0		33	0	0		31	0	0		32	0	0	
22	16	0		22	0	0		23	0	0		24	0	0	
23	17	0		21	0	0		20	0	0		21	0	0	
24	25	0		30	0	0		30	0	0		30	0	0	
25	11	0		23	0	0		22	0	0		22	0	0	
26	23	0		23	0	0		23	0	0		23	0	0	
27	24	0		24	0	0		22	0	0		24	0	0	
28	20	0		18	0	0		19	0	0		20	0	0	
29	21	0		23	0	0		23	0	0		23	0	0	
30	15	0		20	0	0		19	0	0		19	0	0	
31	25	0		23	0	0		23	0	0		23	0	0	
32	22	0		31	0	0		25	0	0		25	0	0	

Table 2: Wind Hazard Conditions

Location	Existing			Existing + Project				Option 1				Option 2			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
33	27	0		25	0	0		24	0	0		24	0	0	
34	21	0		24	0	0		23	0	0		23	0	0	
35	19	0		26	0	0		23	0	0		22	0	0	
36	24	0		25	0	0		22	0	0		23	0	0	
37	31	0		28	0	0		26	0	0		27	0	0	
38	29	0		29	0	0		26	0	0		27	0	0	
39	28	0		26	0	0		26	0	0		25	0	0	
40	25	0		26	0	0		23	0	0		24	0	0	
41	21	0		27	0	0		24	0	0		23	0	0	
42	26	0		27	0	0		27	0	0		27	0	0	
43	30	0		29	0	0		26	0	0		26	0	0	
44	44	28	e	45	36	8	e	38	3	-25	e	41	14	-14	e
45	32	0		28	0	0		22	0	0		23	0	0	
46	35	0		30	0	0		26	0	0		28	0	0	
47	38	2	e	31	0	-2		31	0	-2		34	0	-2	
48	32	0		43	30	30	e	40	6	6	e	40	10	10	e
49	35	0		35	0	0		32	0	0		33	0	0	
50	28	0		22	0	0		20	0	0		20	0	0	
51	26	0		16	0	0		15	0	0		14	0	0	
52	24	0		17	0	0		16	0	0		17	0	0	
53	21	0		18	0	0		19	0	0		18	0	0	
54	29	0		15	0	0		15	0	0		14	0	0	
55	20	0		18	0	0		20	0	0		18	0	0	
56	28	0		21	0	0		22	0	0		21	0	0	
57	30	0		16	0	0		19	0	0		16	0	0	
58	21	0		16	0	0		17	0	0		16	0	0	
59	32	0		18	0	0		20	0	0		18	0	0	
60	22	0		24	0	0		25	0	0		24	0	0	
61	32	0		21	0	0		22	0	0		21	0	0	
62	22	0		14	0	0		14	0	0		14	0	0	
63	34	0		32	0	0		34	0	0		33	0	0	
64	27	0		33	0	0		29	0	0		27	0	0	

Table 2: Wind Hazard Conditions

Location	Existing			Existing + Project				Option 1				Option 2			
	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours per Year Wind Speed Exceeds Hazard Criteria	Hours Change Relative to Existing	Exceeds
65	30	0													
66	18	0													
67	22	0													
68	22	0													
69	25	0													
70	27	0													

Summary	Average (mph)	Total Hours	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total	Average (mph)	Total Hours	Hours Change	Total
	25	**30**	**2 ---- 70**	**25**	**86**	**56**	**4 ---- 70**	**24**	**20**	**-10**	**3 ---- 70**	**24**	**28**	**-2**	**3 ---- 70**

APPENDIX B3

PRELIMINARY RESULTS

SFMTA POTRERO YARD

SAN FRANCISCO, CA

PEDESTRIAN WIND STUDY
RWDI # 2000654
June 22, 2020

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed SFMTA Potrero Yards in San Francisco, CA (Image 1). RWDI conducted an initial wind tunnel testing of the Existing, Existing + Proposed and Proposed + Cumulative configurations in February 2020. Based on our initial wind-tunnel testing, RWDI developed some wind control measures for the identified windy areas in conjunction with the design team and the San Francisco Planning Department. Two mitigation options were tested recently (Option 1 and Option 2), together with a revised Existing configuration in May 2020. Based on the results for those mitigation configurations, additional recommendations were made to mitigate winds at the southwest corner of the project site, and six additional configurations were tested. **Note that porous portions of the façade on the north, east and west sides of the project were modeled during this round of wind tunnel testing.** Following is a description of the configurations presented in this report:

A. Existing	Existing site and surroundings with existing landscaping and localized contouring around Franklin Square (tested in May 2020)
B. Existing + Project	Proposed project with existing surroundings, but without any landscaping (tested in February 2020, but presented here again for comparison purpose only)
F. Option 3	Proposed project with existing surroundings and landscaping, including the following wind control measures: • Proposed landscaping on-site • 15 x20 ft. recess at the southwest corner, from grade level to the podium roof • Elevated porous screens on the west façade • Porous canopy at the southwest corner of the project • Vertical porous wind screen to the north of Location #1 at grade level
G. Option 4	Same as Option 3, with the vertical porous wind screen to the north of Location #1 removed
H. Option 5	Same as Option 4, with 15 x20 ft. recess at the southwest corner, from grade level to 12 ft and then squared corner from 12ft to the podium roof
I. Option 6	Same as Option 5, with the porous canopy at the southwest corner removed
J. Option 7	Same Option 6, with elevated porous wind screens on the west facade removed
K. Option 7 + Cumulative	Proposed project with existing and future surroundings and landscaping, including the wind control measures tested for Option 7.

The potential wind comfort and hazard conditions are shown in a site plan in Figures 1A through 2K and the associated wind comfort and wind hazard speeds are listed in Tables 1.

Image 2A: Wind Tunnel Study Model – Existing Configuration

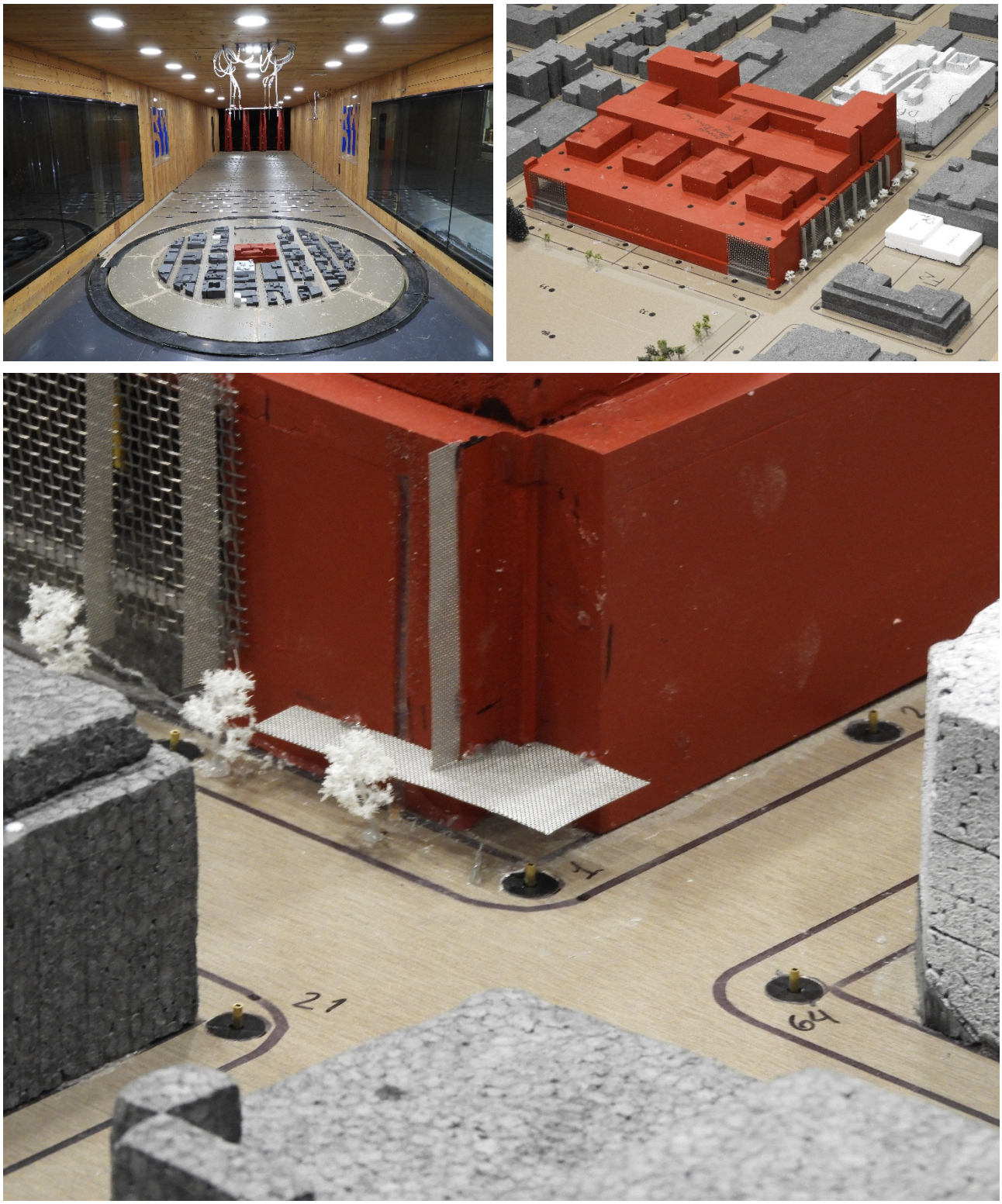


Image 2F: Wind Tunnel Study Model – Option 3 Configuration

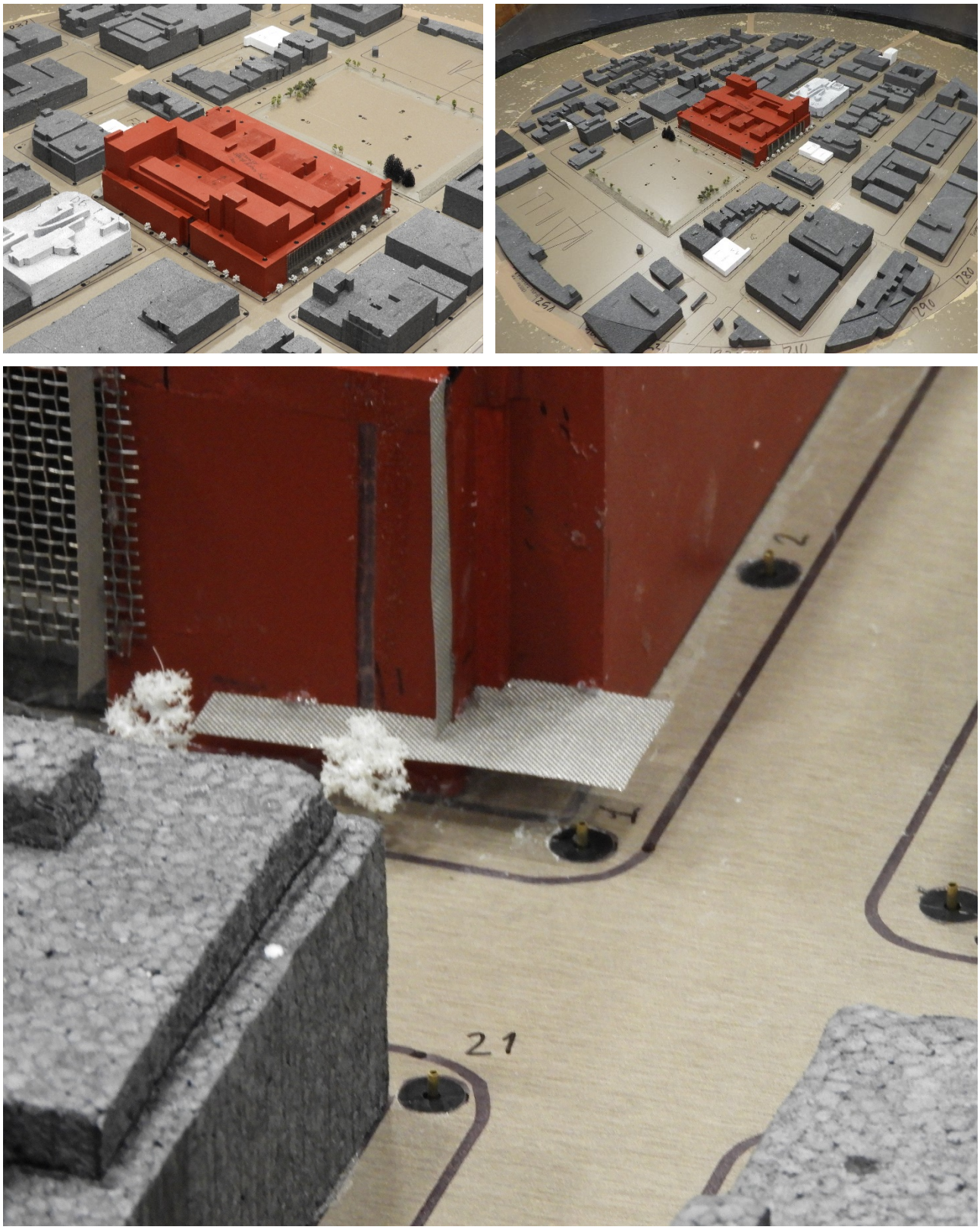


Image 2G: Wind Tunnel Study Model – Option 4 Configuration

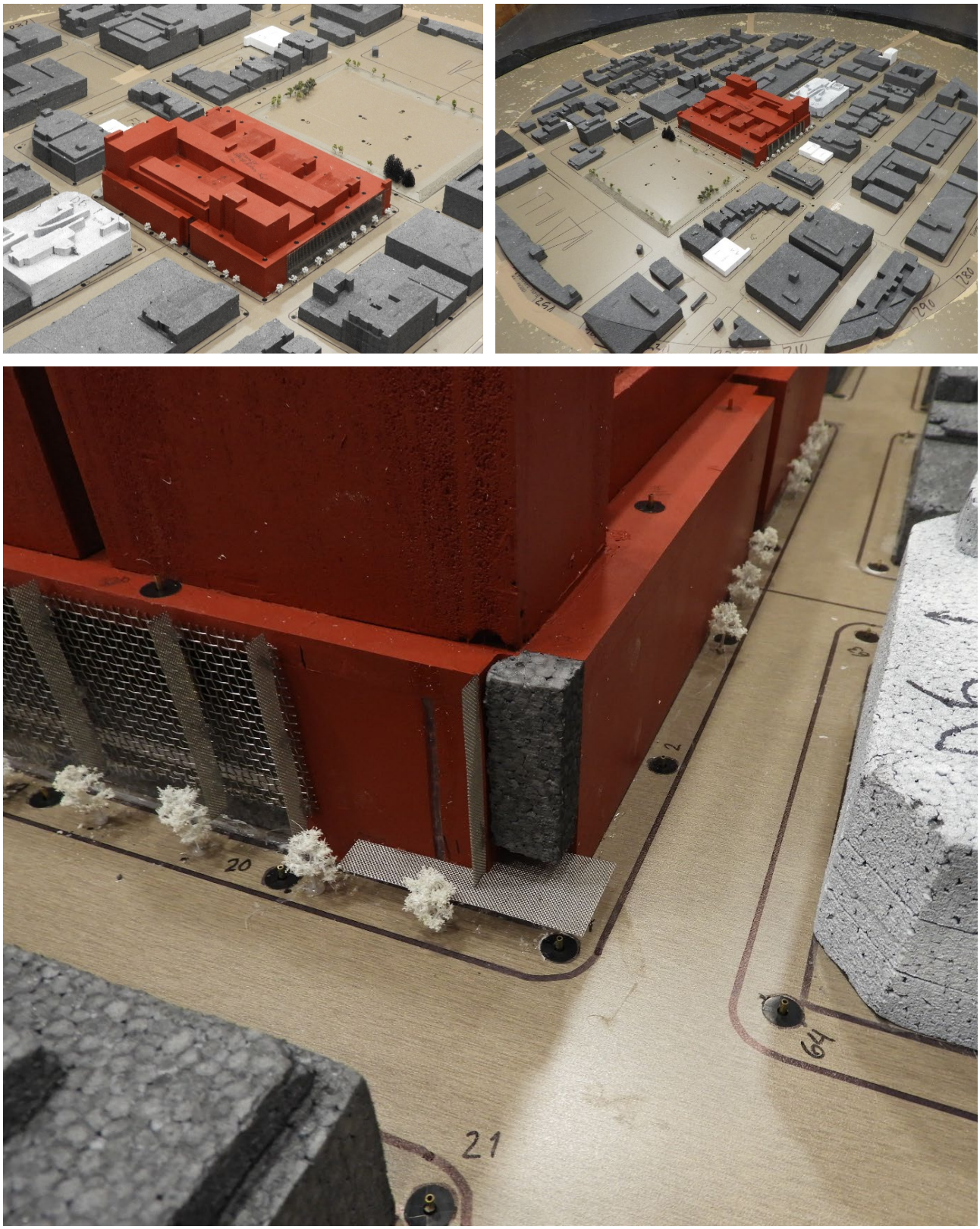


Image 2H: Wind Tunnel Study Model – Option 5 Configuration

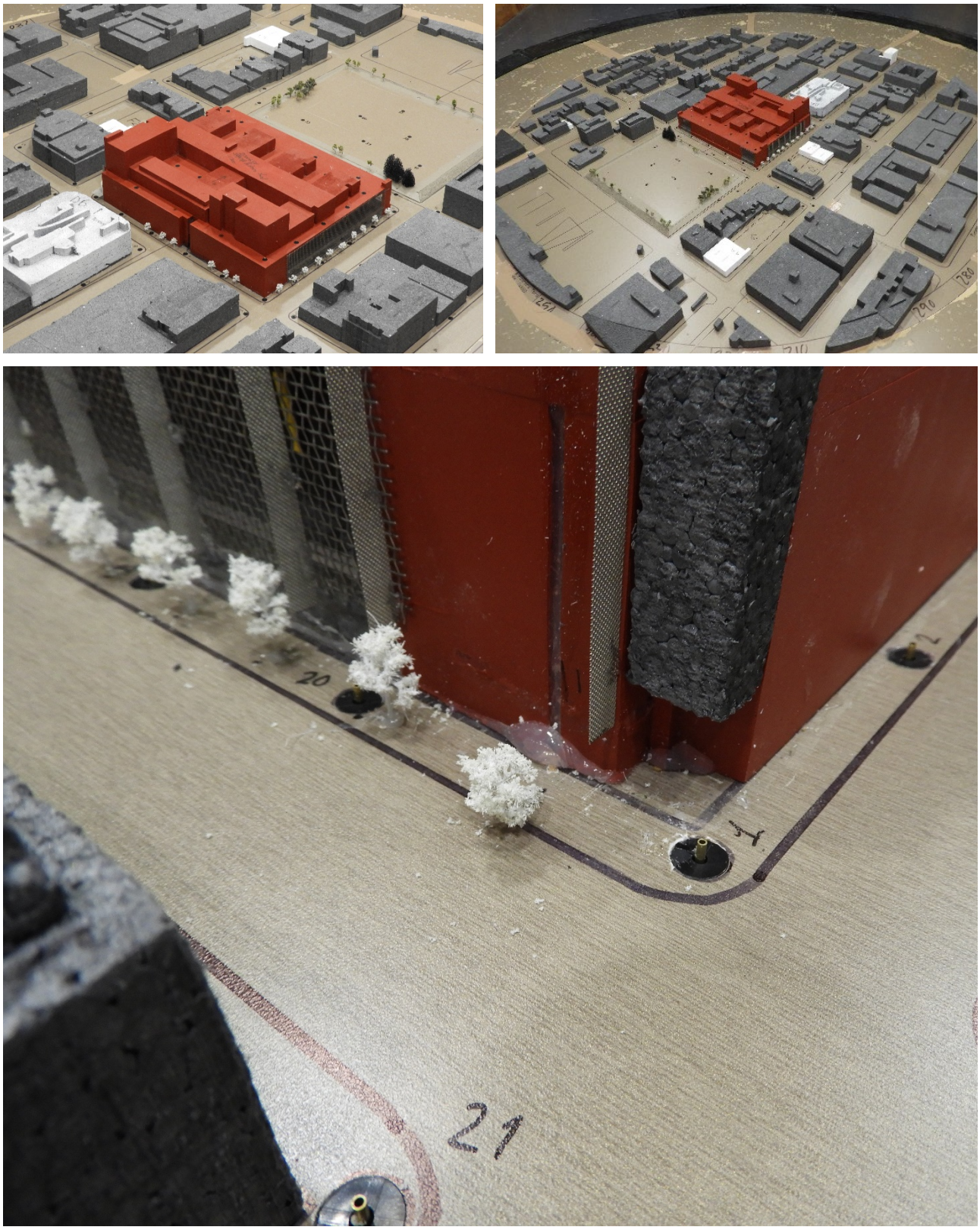
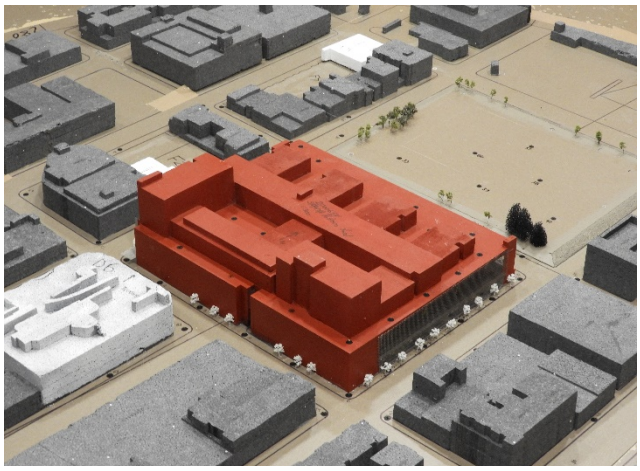


Image 2I: Wind Tunnel Study Model – Option 6 Configuration



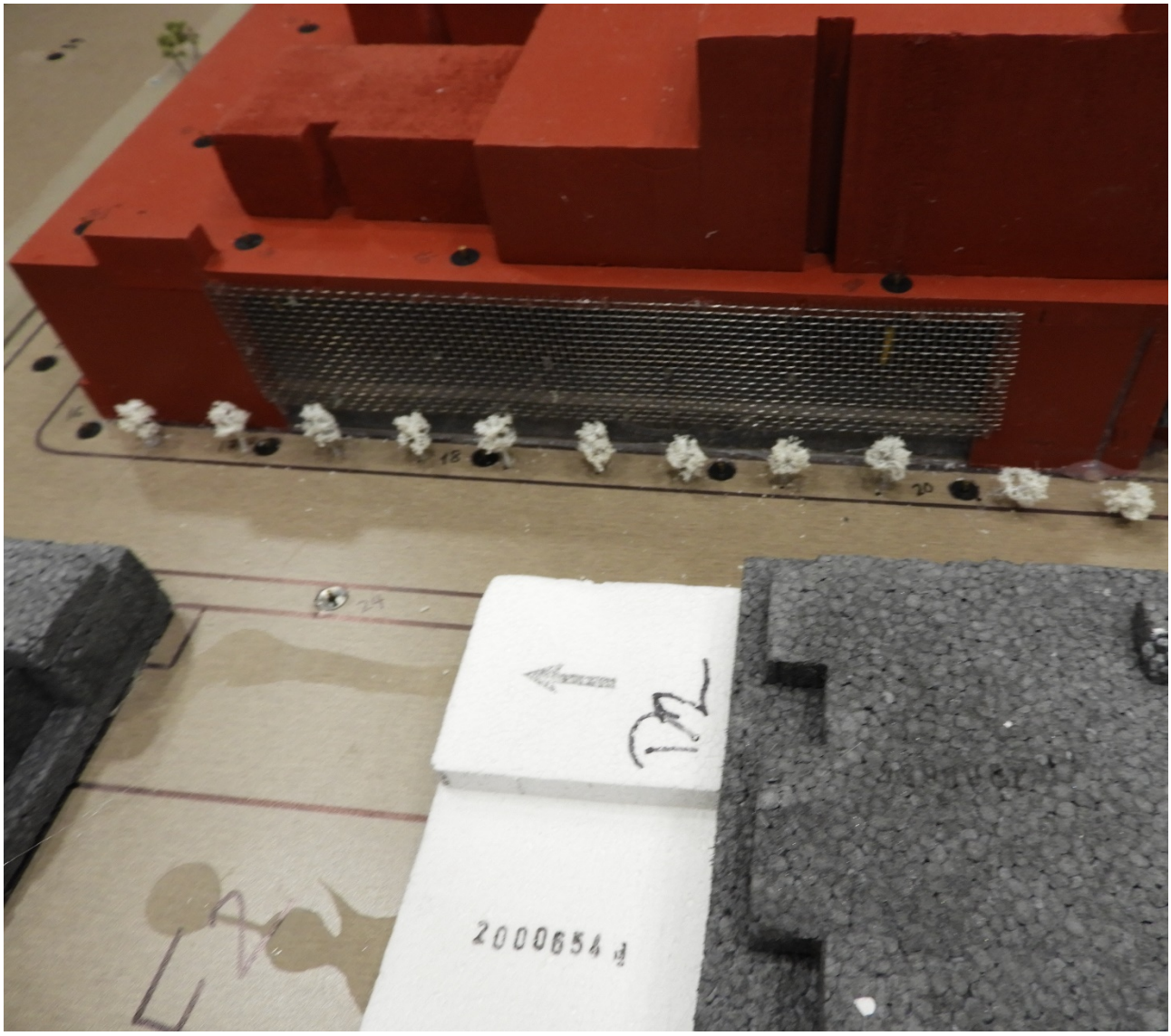
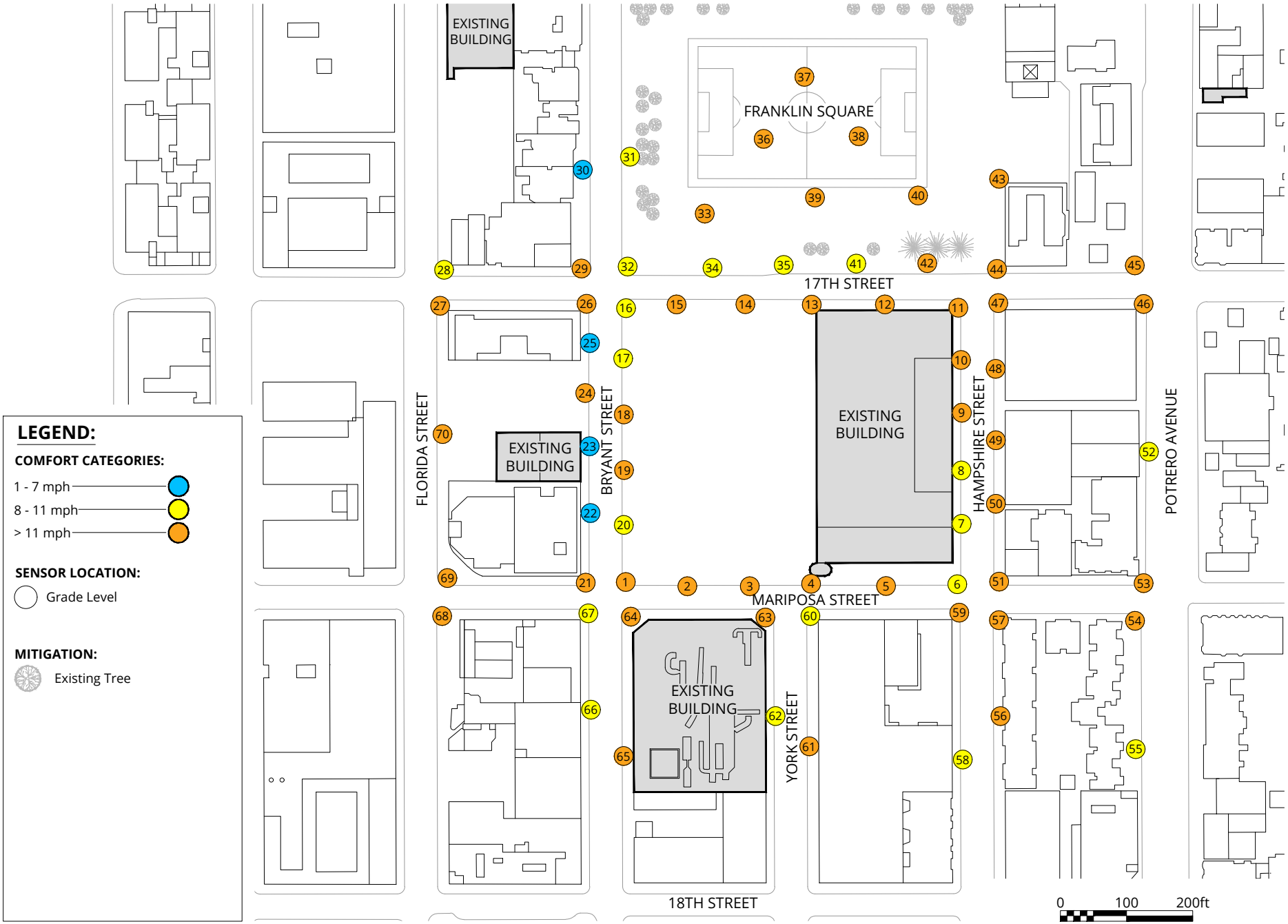


Image 2J: Wind Tunnel Study Model – Option 7 Configuration

Image 2K: Wind Tunnel Study Model – Option 7 + Cumulative Configuration

FIGURES



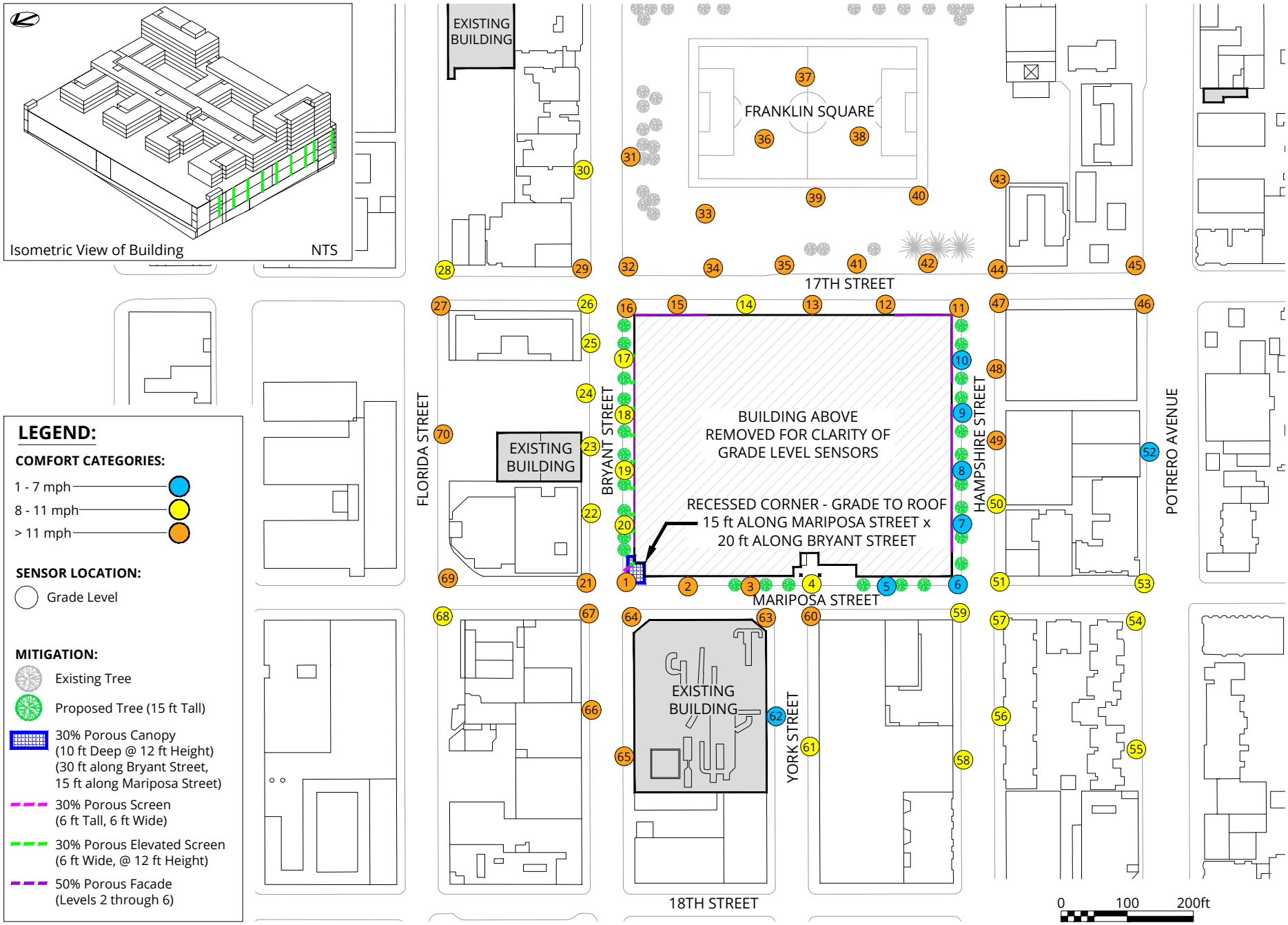
Pedestrian Wind Comfort Conditions
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1A
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



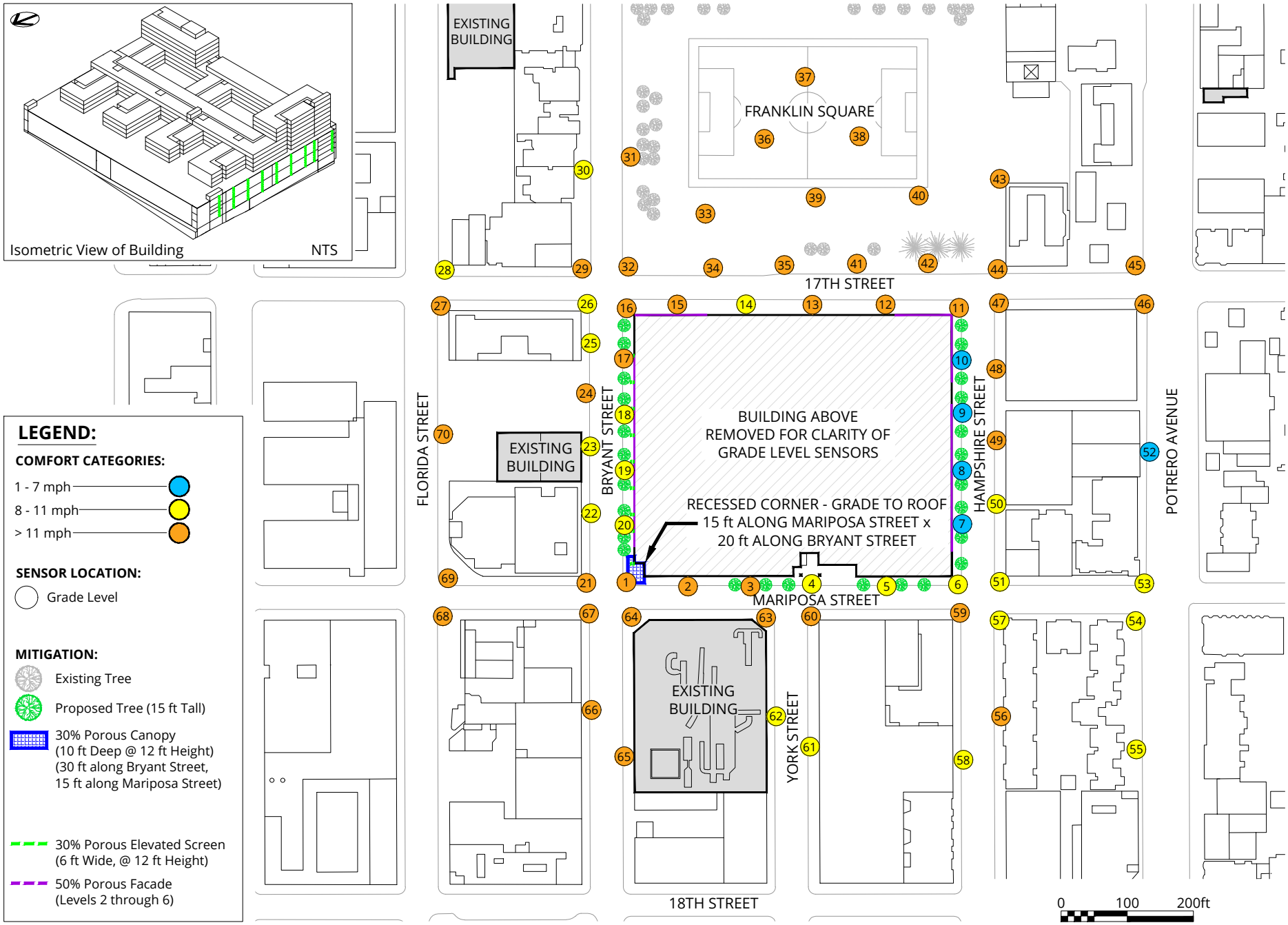
Pedestrian Wind Comfort Conditions
Option 3
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure: 1F
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Comfort Conditions

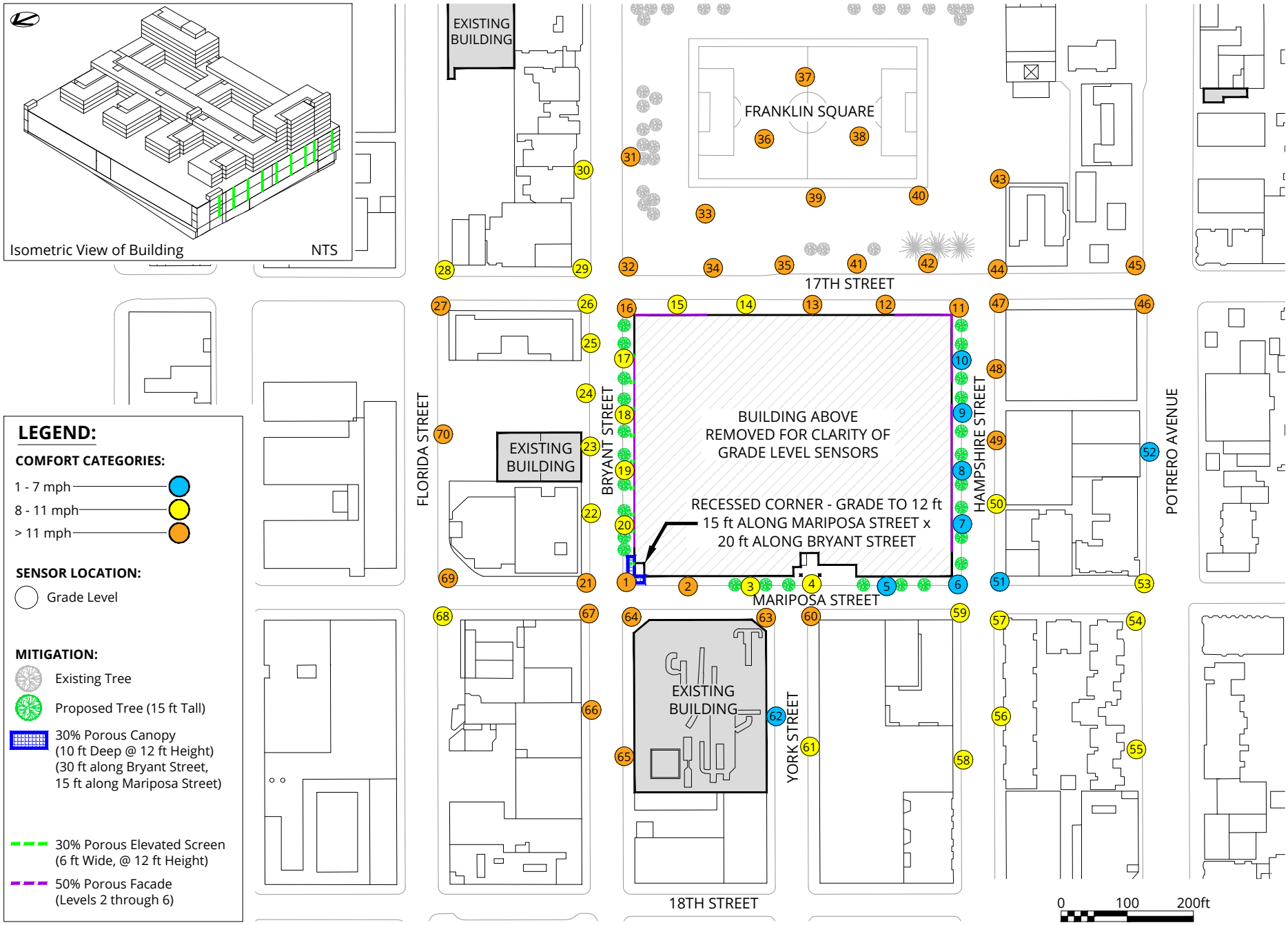
Option 4
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure:	1G
Approx. Scale:	1"=200'	
Date Revised:	June 18, 2020	



Pedestrian Wind Comfort Conditions

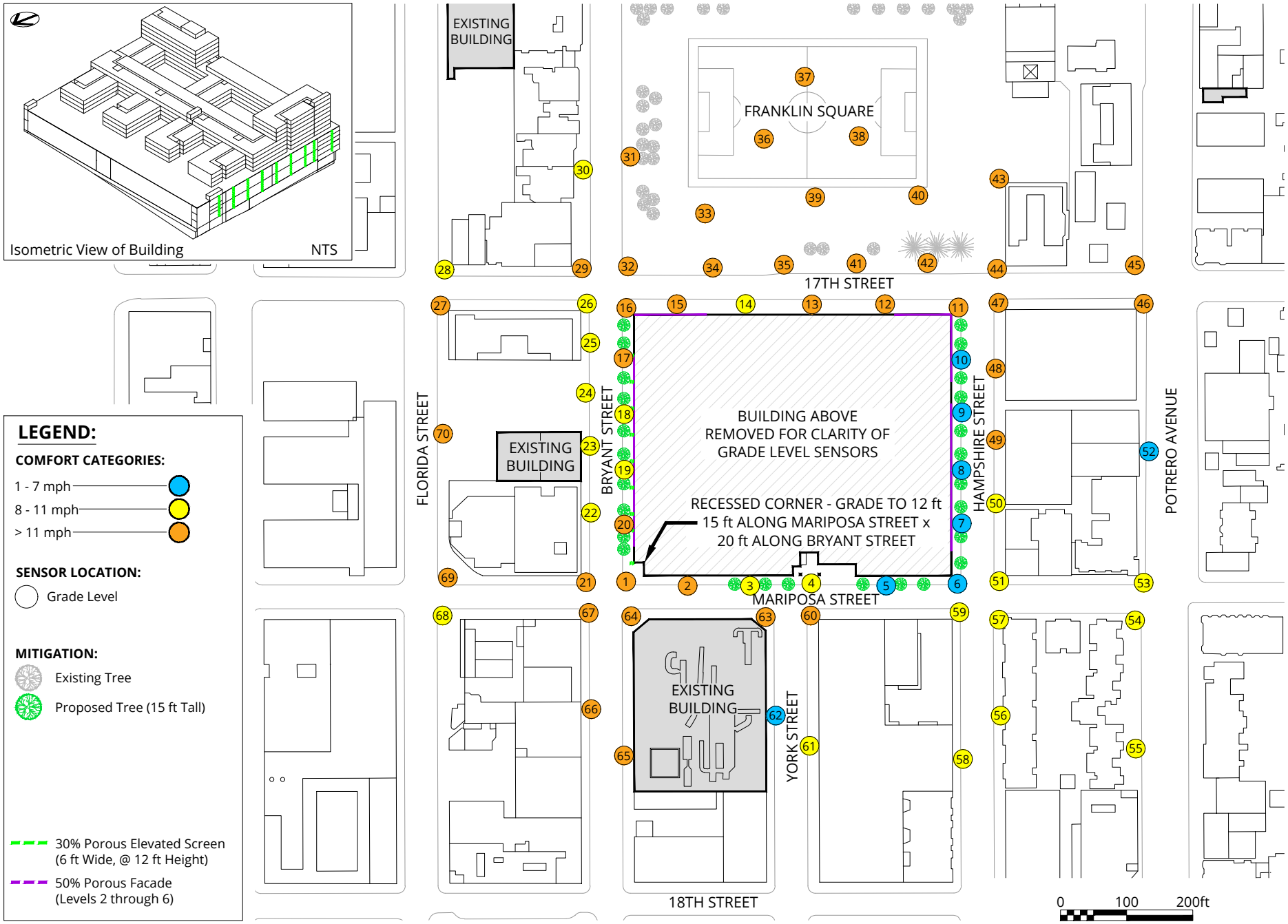
Option 5
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure: 1H
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Comfort Conditions

Option 6

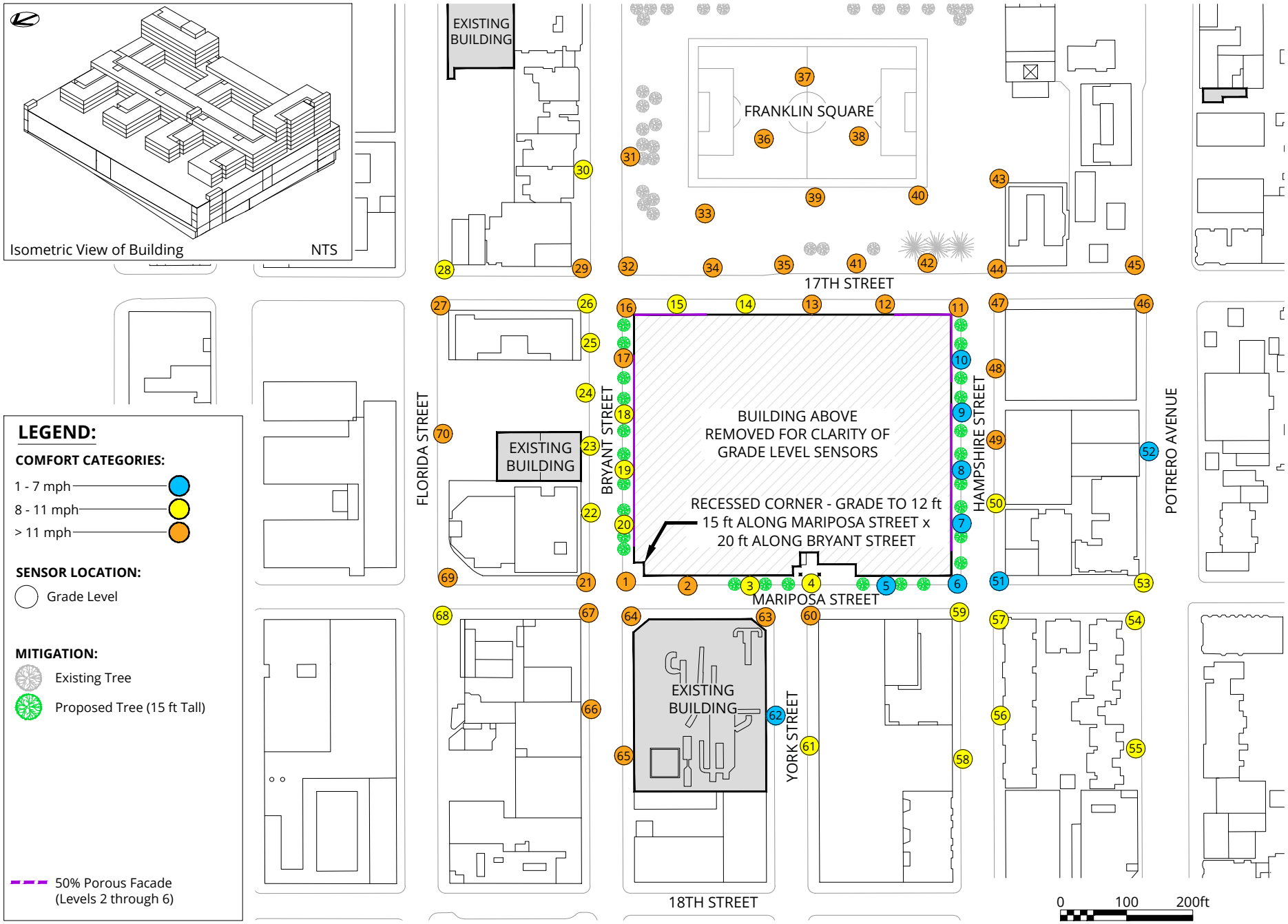
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure: 1I
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Comfort Conditions

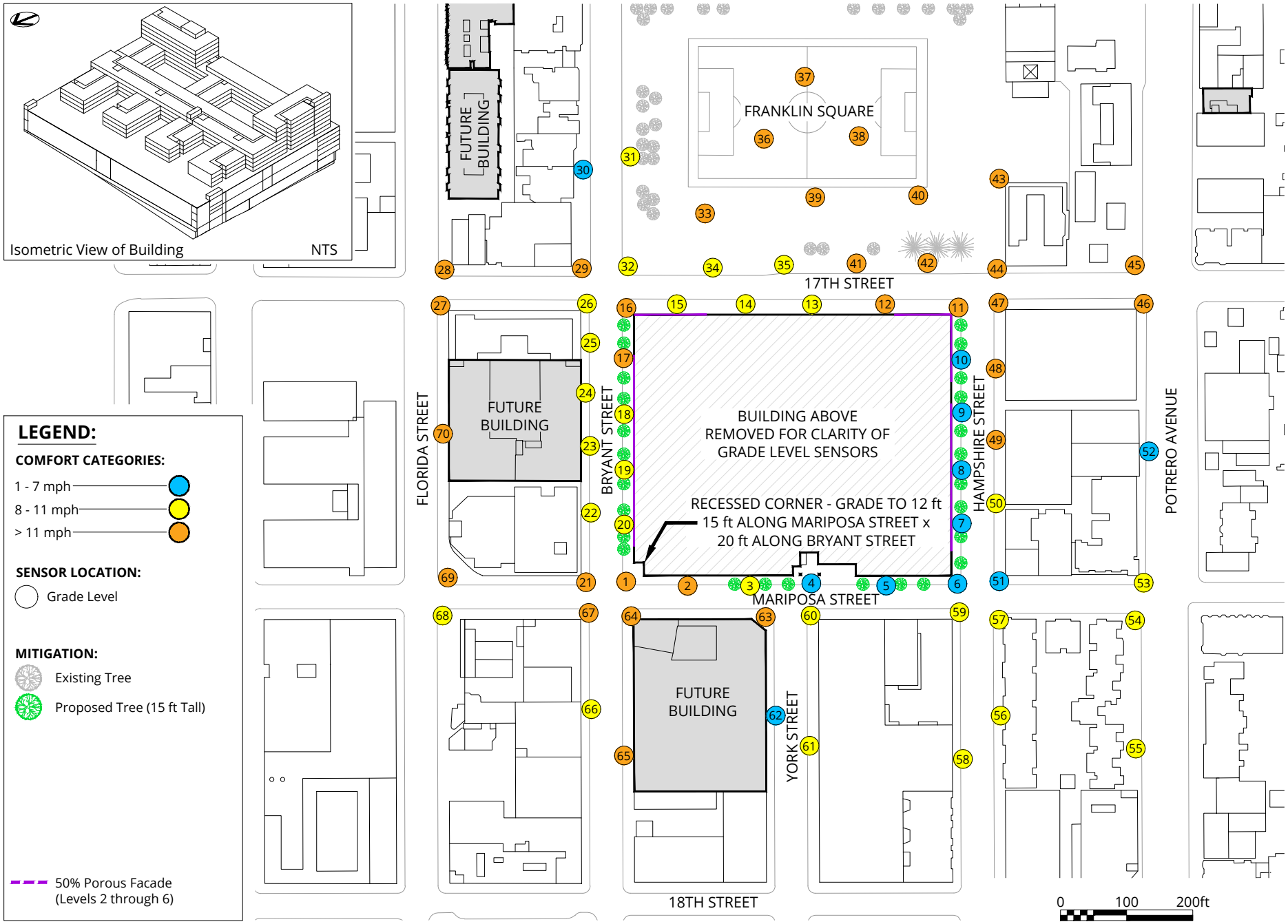
Option 7
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1J
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Comfort Conditions

Project + Cumulative

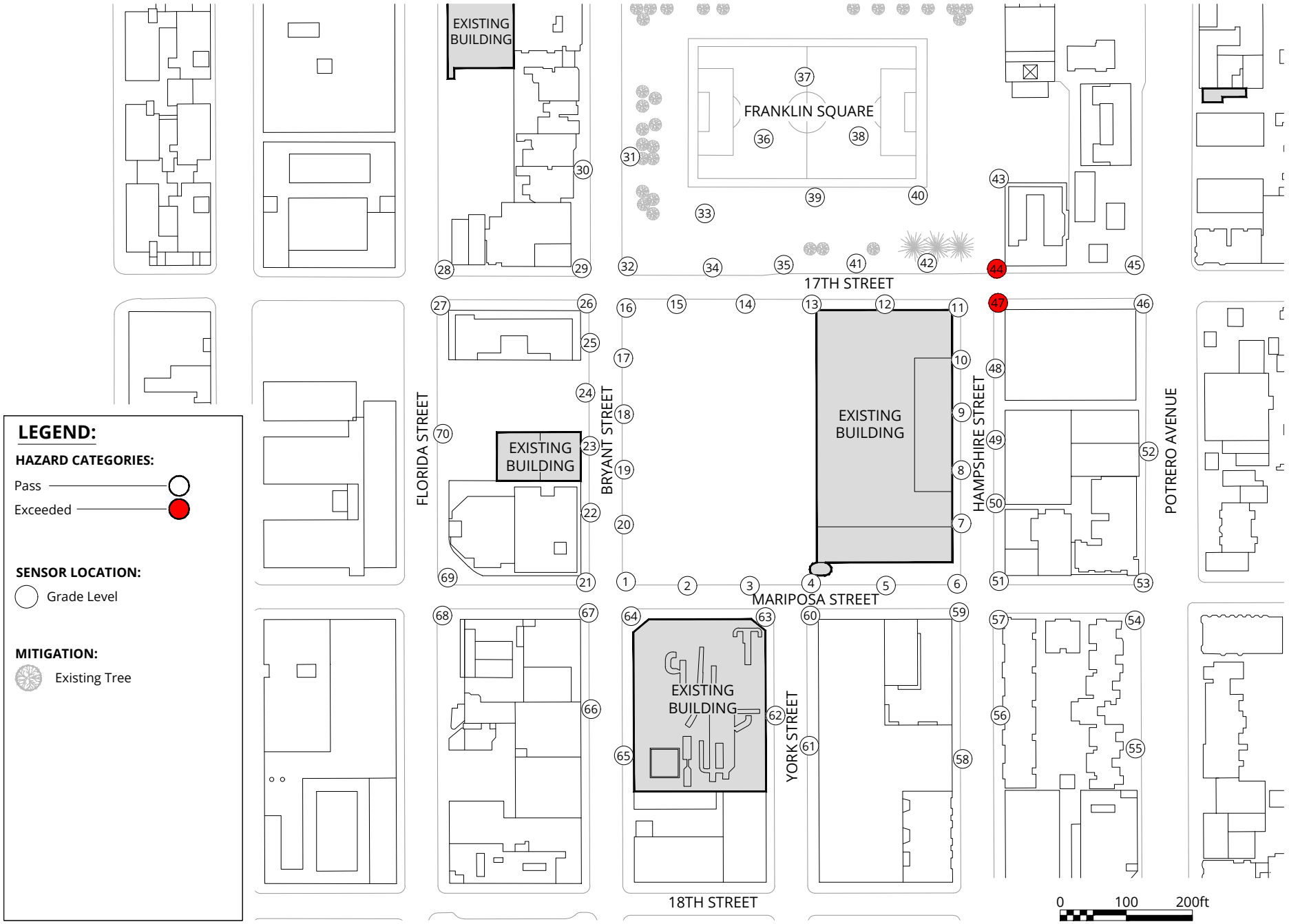
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 1K
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



LEGEND:

HAZARD CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

MITIGATION:

Existing Tree

Pedestrian Wind Hazard Conditions

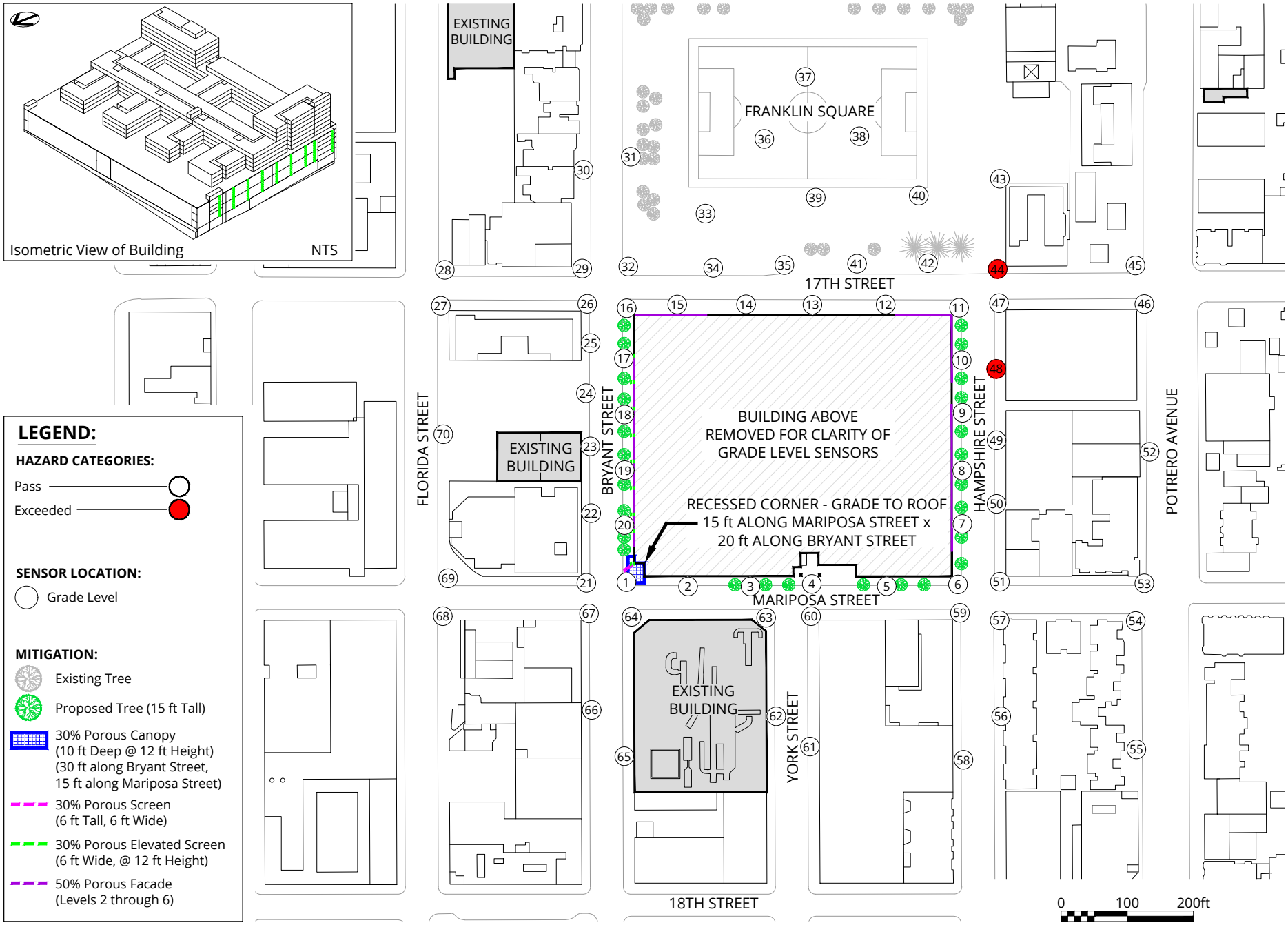
Existing
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2A
Approx. Scale:	1"=200'
Date Revised:	July 2, 2020



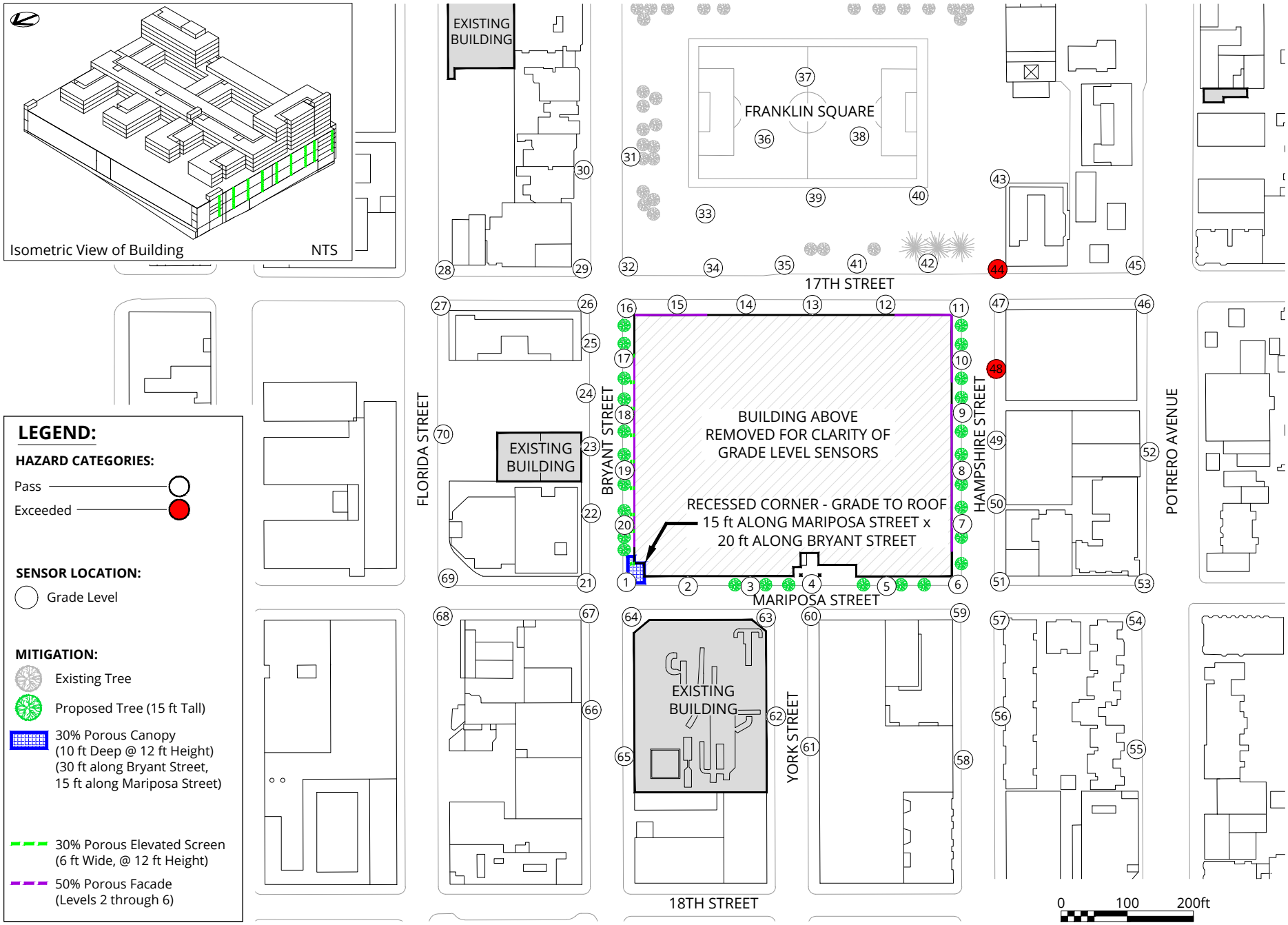
Pedestrian Wind Hazard Conditions
Option 3
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2F
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Hazard Conditions

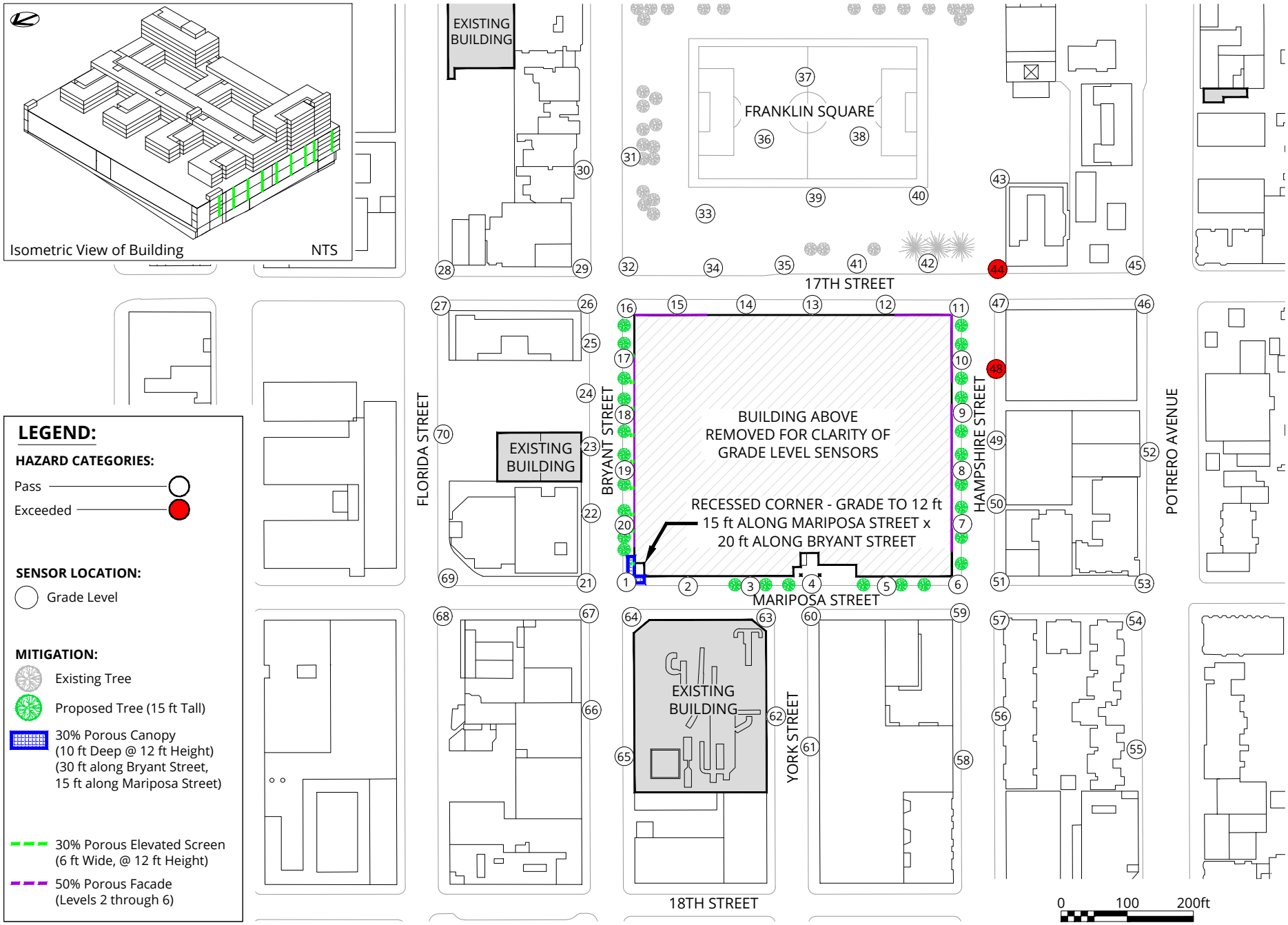
Option 4
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2G
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Hazard Conditions

Option 5

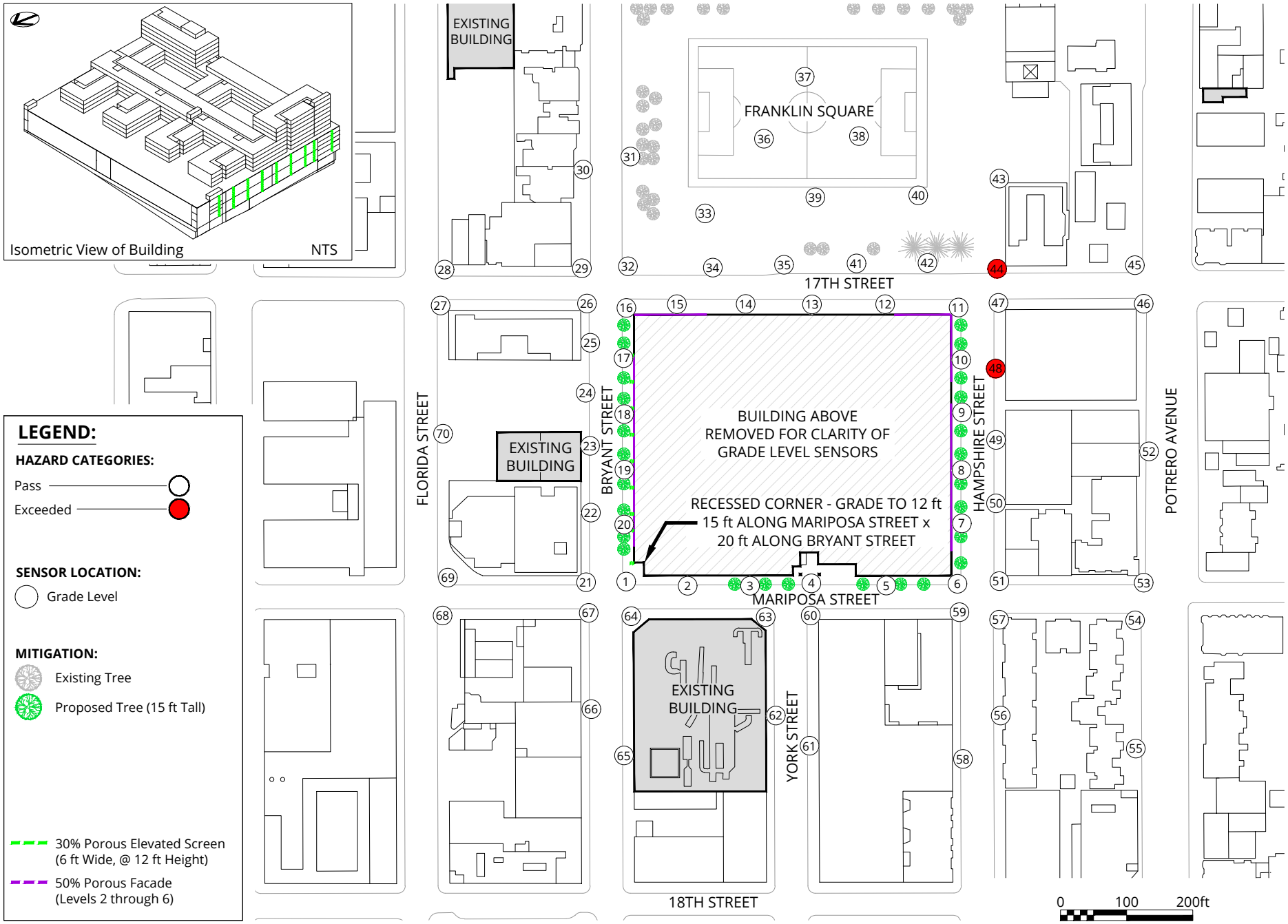
Annual

SFMTA Potrero Yard - San Francisco, CA

Project #2000654

True North

Drawn by: GRE	Figure: 2H
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Hazard Conditions

Option 6

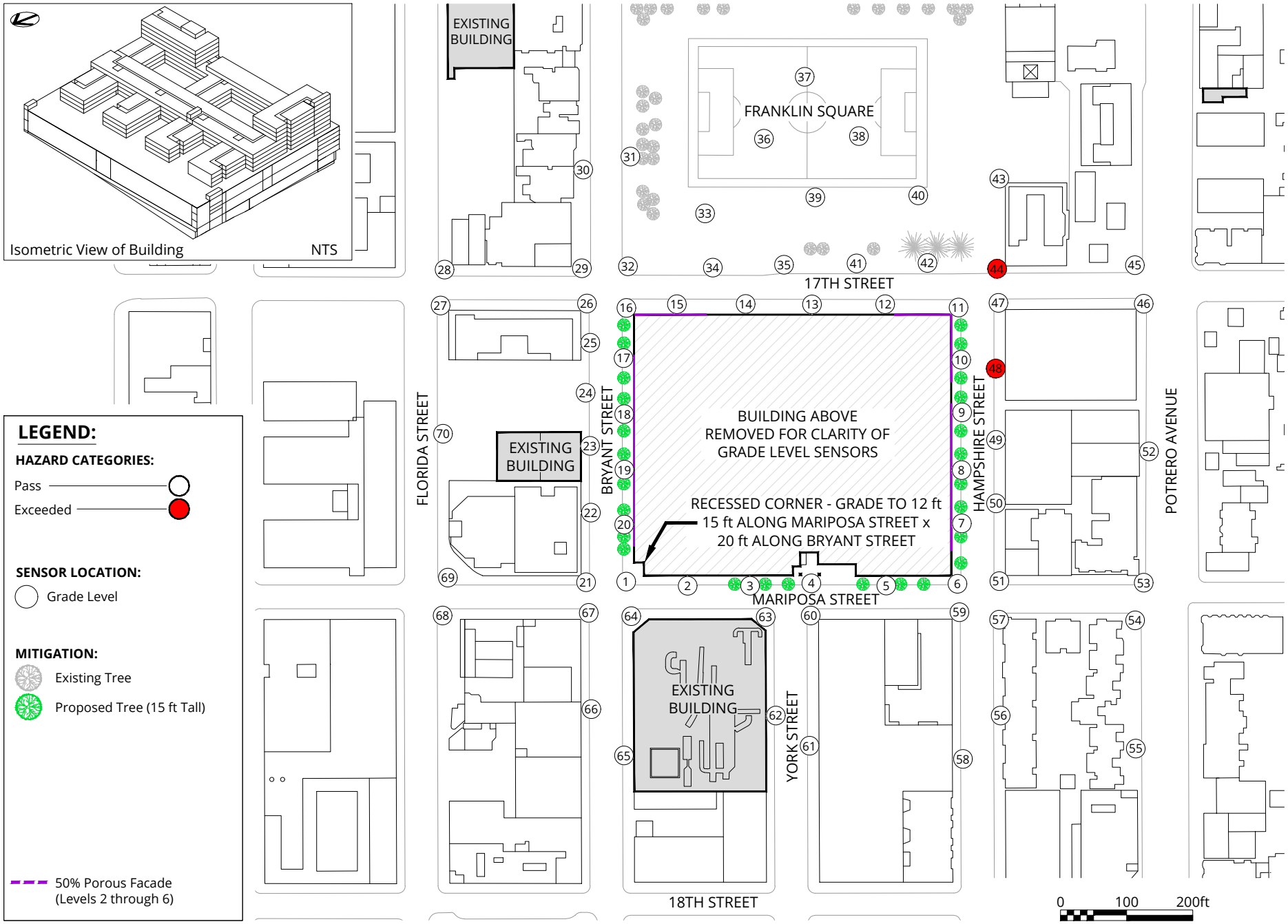
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2I
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Hazard Conditions

Option 7

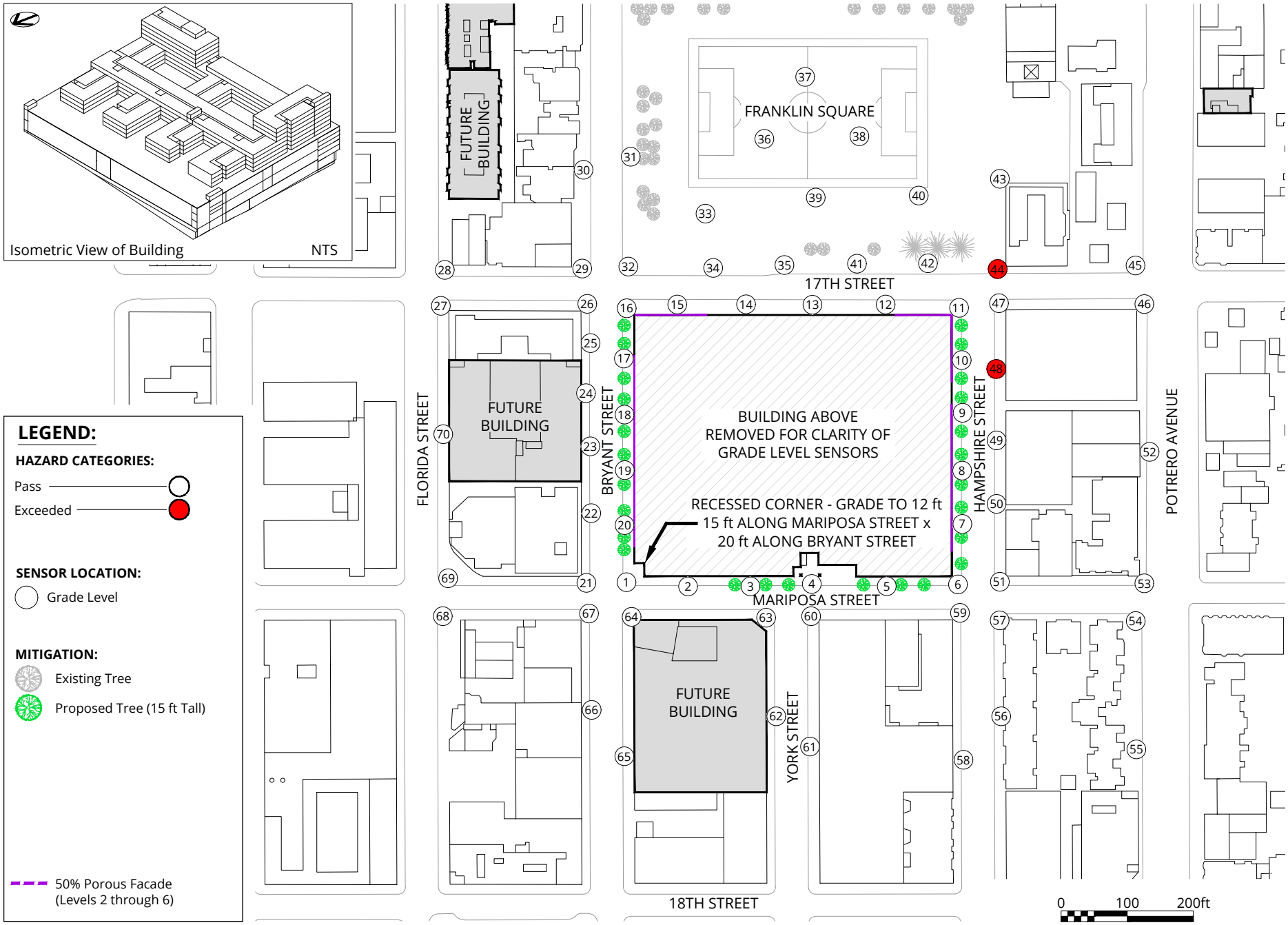
Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2J
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020



Pedestrian Wind Hazard Conditions

Project + Cumulative

Annual

SFMTA Potrero Yard - San Francisco, CA

True North

Project #2000654

Drawn by: GRE	Figure: 2K
Approx. Scale:	1"=200'
Date Revised:	June 18, 2020

TABLES

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
1	Existing	12	18	-	e	23	0	-	
	Option 3	12	13	0	e	22	0	0	
	Option 4	18	39	6	e	32	0	0	
	Option 5	17	34	5	e	31	0	0	
	Option 6	16	29	4	e	32	0	0	
	Option 7	16	30	4	e	31	0	0	
	Option 7 + Cumulative	15	25	3	e	28	0	0	
2	Existing	12	12	-	e	23	0	-	
	Option 3	14	23	2	e	31	0	0	
	Option 4	15	27	3	e	32	0	0	
	Option 5	12	12	0	e	25	0	0	
	Option 6	13	18	1	e	24	0	0	
	Option 7	13	17	1	e	24	0	0	
	Option 7 + Cumulative	12	15	0	e	23	0	0	
3	Existing	12	14	-	e	25	0	-	
	Option 3	12	15	0	e	26	0	0	
	Option 4	13	19	1	e	28	0	0	
	Option 5	10	8	-2		22	0	0	
	Option 6	10	7	-2		21	0	0	
	Option 7	9	4	-3		18	0	0	
	Option 7 + Cumulative	11	10	-1		21	0	0	
4	Existing	12	17	-	e	23	0	-	
	Option 3	9	3	-3		17	0	0	
	Option 4	9	4	-3		17	0	0	
	Option 5	8	2	-4		16	0	0	
	Option 6	8	2	-4		16	0	0	
	Option 7	8	1	-4		15	0	0	
	Option 7 + Cumulative	7	1	-5		15	0	0	
5	Existing	13	15	-	e	24	0	-	
	Option 3	7	1	-6		15	0	0	
	Option 4	8	2	-5		16	0	0	
	Option 5	7	1	-6		14	0	0	
	Option 6	7	1	-6		15	0	0	
	Option 7	7	0	-6		14	0	0	
	Option 7 + Cumulative	6	0	-7		12	0	0	
6	Existing	11	10	-		21	0	-	
	Option 3	7	1	-4		15	0	0	
	Option 4	8	1	-3		16	0	0	
	Option 5	7	0	-4		14	0	0	
	Option 6	7	0	-4		14	0	0	
	Option 7	7	1	-4		15	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 7 + Cumulative	7	0	-4		14	0	0	
7	Existing	10	6	-		19	0	-	
	Option 3	6	0	-4		12	0	0	
	Option 4	6	0	-4		12	0	0	
	Option 5	6	0	-4		12	0	0	
	Option 6	6	0	-4		13	0	0	
	Option 7	6	0	-4		12	0	0	
	Option 7 + Cumulative	5	0	-5		11	0	0	
8	Existing	11	10	-		21	0	-	
	Option 3	5	0	-6		10	0	0	
	Option 4	5	0	-6		11	0	0	
	Option 5	5	0	-6		11	0	0	
	Option 6	5	0	-6		11	0	0	
	Option 7	6	0	-5		11	0	0	
	Option 7 + Cumulative	5	0	-6		9	0	0	
9	Existing	12	13	-	e	22	0	-	
	Option 3	6	0	-6		12	0	0	
	Option 4	6	0	-6		12	0	0	
	Option 5	6	0	-6		11	0	0	
	Option 6	6	0	-6		12	0	0	
	Option 7	6	0	-6		12	0	0	
	Option 7 + Cumulative	6	0	-6		11	0	0	
10	Existing	14	23	-	e	28	0	-	
	Option 3	7	0	-7		13	0	0	
	Option 4	7	0	-7		13	0	0	
	Option 5	7	0	-7		13	0	0	
	Option 6	7	1	-7		14	0	0	
	Option 7	6	0	-8		14	0	0	
	Option 7 + Cumulative	7	0	-7		14	0	0	
11	Existing	17	32	-	e	34	0	-	
	Option 3	16	28	-1	e	32	0	0	
	Option 4	16	27	-1	e	32	0	0	
	Option 5	16	27	-1	e	32	0	0	
	Option 6	16	29	-1	e	33	0	0	
	Option 7	16	28	-1	e	32	0	0	
	Option 7 + Cumulative	16	28	-1	e	32	0	0	
12	Existing	13	15	-	e	27	0	-	
	Option 3	14	19	1	e	30	0	0	
	Option 4	14	18	1	e	30	0	0	
	Option 5	14	17	1	e	30	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 6	14	19	1	e	30	0	0	
	Option 7	14	19	1	e	30	0	0	
	Option 7 + Cumulative	13	16	0	e	29	0	0	
13	Existing	14	22	-	e	26	0	-	
	Option 3	12	12	-2	e	24	0	0	
	Option 4	12	13	-2	e	24	0	0	
	Option 5	12	11	-2	e	25	0	0	
	Option 6	12	12	-2	e	26	0	0	
	Option 7	12	12	-2	e	25	0	0	
	Option 7 + Cumulative	11	10	-3		25	0	0	
14	Existing	13	18	-	e	26	0	-	
	Option 3	11	10	-2		21	0	0	
	Option 4	11	10	-2		21	0	0	
	Option 5	10	8	-3		21	0	0	
	Option 6	11	10	-2		22	0	0	
	Option 7	11	10	-2		21	0	0	
	Option 7 + Cumulative	10	8	-3		22	0	0	
15	Existing	12	13	-	e	23	0	-	
	Option 3	12	15	0	e	20	0	0	
	Option 4	12	17	0	e	20	0	0	
	Option 5	11	10	-1		20	0	0	
	Option 6	12	15	0	e	20	0	0	
	Option 7	11	10	-1		20	0	0	
	Option 7 + Cumulative	10	5	-2		18	0	0	
16	Existing	10	6	-		18	0	-	
	Option 3	16	30	6	e	30	0	0	
	Option 4	16	31	6	e	30	0	0	
	Option 5	15	27	5	e	29	0	0	
	Option 6	15	29	5	e	29	0	0	
	Option 7	15	28	5	e	29	0	0	
	Option 7 + Cumulative	12	16	2	e	23	0	0	
17	Existing	9	4	-		19	0	-	
	Option 3	11	10	2		23	0	0	
	Option 4	12	15	3	e	23	0	0	
	Option 5	11	10	2		24	0	0	
	Option 6	12	12	3	e	24	0	0	
	Option 7	12	13	3	e	25	0	0	
	Option 7 + Cumulative	12	13	3	e	26	0	0	
18	Existing	13	15	-	e	26	0	-	
	Option 3	10	6	-3		19	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 4	11	10	-2		19	0	0	
	Option 5	10	4	-3		18	0	0	
	Option 6	10	6	-3		18	0	0	
	Option 7	11	10	-2		20	0	0	
	Option 7 + Cumulative	11	10	-2		21	0	0	
19	Existing	13	18	-	e	26	0	-	
	Option 3	9	5	-4		20	0	0	
	Option 4	10	6	-3		20	0	0	
	Option 5	9	5	-4		19	0	0	
	Option 6	9	5	-4		20	0	0	
	Option 7	9	5	-4		19	0	0	
	Option 7 + Cumulative	8	1	-5		16	0	0	
20	Existing	10	7	-		24	0	-	
	Option 3	11	10	1		24	0	0	
	Option 4	11	10	1		24	0	0	
	Option 5	11	10	1		23	0	0	
	Option 6	12	13	2	e	24	0	0	
	Option 7	11	10	1		24	0	0	
	Option 7 + Cumulative	10	6	0		20	0	0	
21	Existing	13	17	-	e	23	0	-	
	Option 3	14	20	1	e	30	0	0	
	Option 4	15	25	2	e	30	0	0	
	Option 5	13	20	0	e	28	0	0	
	Option 6	14	21	1	e	29	0	0	
	Option 7	13	20	0	e	28	0	0	
	Option 7 + Cumulative	14	21	1	e	26	0	0	
22	Existing	7	1	-		16	0	-	
	Option 3	10	9	3		22	0	0	
	Option 4	11	10	4		22	0	0	
	Option 5	10	8	3		22	0	0	
	Option 6	10	9	3		22	0	0	
	Option 7	10	8	3		21	0	0	
	Option 7 + Cumulative	9	3	2		17	0	0	
23	Existing	7	1	-		17	0	-	
	Option 3	10	6	3		19	0	0	
	Option 4	11	10	4		19	0	0	
	Option 5	10	5	3		18	0	0	
	Option 6	10	6	3		18	0	0	
	Option 7	10	6	3		18	0	0	
	Option 7 + Cumulative	10	5	3		18	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
24	Existing	13	20	-	e	25	0	-	
	Option 3	11	10	-2		21	0	0	
	Option 4	12	13	-1	e	21	0	0	
	Option 5	11	10	-2		21	0	0	
	Option 6	11	10	-2		21	0	0	
	Option 7	11	10	-2		20	0	0	
	Option 7 + Cumulative	10	7	-3		19	0	0	
25	Existing	6	0	-		11	0	-	
	Option 3	10	5	4		18	0	0	
	Option 4	10	5	4		18	0	0	
	Option 5	9	4	3		18	0	0	
	Option 6	9	4	3		18	0	0	
	Option 7	9	3	3		18	0	0	
	Option 7 + Cumulative	10	4	4		19	0	0	
26	Existing	12	13	-	e	23	0	-	
	Option 3	10	6	-2		19	0	0	
	Option 4	10	6	-2		19	0	0	
	Option 5	10	5	-2		18	0	0	
	Option 6	10	6	-2		19	0	0	
	Option 7	9	5	-3		18	0	0	
	Option 7 + Cumulative	10	6	-2		19	0	0	
27	Existing	14	22	-	e	24	0	-	
	Option 3	16	29	2	e	29	0	0	
	Option 4	16	30	2	e	29	0	0	
	Option 5	15	25	1	e	28	0	0	
	Option 6	15	26	1	e	28	0	0	
	Option 7	15	25	1	e	27	0	0	
	Option 7 + Cumulative	15	28	1	e	27	0	0	
28	Existing	10	7	-		20	0	-	
	Option 3	10	8	0		21	0	0	
	Option 4	11	10	1		21	0	0	
	Option 5	10	6	0		20	0	0	
	Option 6	10	6	0		20	0	0	
	Option 7	10	6	0		19	0	0	
	Option 7 + Cumulative	16	28	6	e	35	0	0	
29	Existing	12	13	-	e	21	0	-	
	Option 3	12	15	0	e	22	0	0	
	Option 4	13	19	1	e	22	0	0	
	Option 5	11	10	-1		21	0	0	
	Option 6	12	14	0	e	22	0	0	
	Option 7	12	13	0	e	22	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 7 + Cumulative	12	15	0	e	23	0	0	
30	Existing	6	1	-		15	0	-	
	Option 3	9	2	3		17	0	0	
	Option 4	9	3	3		17	0	0	
	Option 5	8	2	2		16	0	0	
	Option 6	9	3	3		17	0	0	
	Option 7	8	1	2		16	0	0	
	Option 7 + Cumulative	7	0	1		15	0	0	
31	Existing	11	10	-		25	0	-	
	Option 3	13	19	2	e	23	0	0	
	Option 4	13	21	2	e	24	0	0	
	Option 5	12	17	1	e	23	0	0	
	Option 6	13	19	2	e	24	0	0	
	Option 7	12	18	1	e	23	0	0	
	Option 7 + Cumulative	11	10	0		22	0	0	
32	Existing	11	10	-		22	0	-	
	Option 3	14	20	3	e	24	0	0	
	Option 4	13	19	2	e	24	0	0	
	Option 5	13	19	2	e	23	0	0	
	Option 6	13	19	2	e	24	0	0	
	Option 7	13	18	2	e	23	0	0	
	Option 7 + Cumulative	10	7	-1		22	0	0	
33	Existing	13	21	-	e	27	0	-	
	Option 3	13	21	0	e	24	0	0	
	Option 4	14	23	1	e	25	0	0	
	Option 5	13	20	0	e	24	0	0	
	Option 6	14	22	1	e	25	0	0	
	Option 7	13	21	0	e	25	0	0	
	Option 7 + Cumulative	12	16	-1	e	21	0	0	
34	Existing	11	10	-		21	0	-	
	Option 3	13	20	2	e	22	0	0	
	Option 4	13	21	2	e	23	0	0	
	Option 5	13	18	2	e	22	0	0	
	Option 6	13	19	2	e	22	0	0	
	Option 7	13	17	2	e	21	0	0	
	Option 7 + Cumulative	11	10	0		20	0	0	
35	Existing	10	7	-		19	0	-	
	Option 3	12	13	2	e	21	0	0	
	Option 4	12	14	2	e	21	0	0	
	Option 5	12	14	2	e	21	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 6	12	15	2	e	22	0	0	
	Option 7	12	13	2	e	21	0	0	
	Option 7 + Cumulative	11	10	1		22	0	0	
36	Existing	13	17	-	e	24	0	-	
	Option 3	12	16	-1	e	24	0	0	
	Option 4	13	19	0	e	24	0	0	
	Option 5	12	17	-1	e	24	0	0	
	Option 6	13	17	0	e	24	0	0	
	Option 7	13	17	0	e	24	0	0	
	Option 7 + Cumulative	12	14	-1	e	24	0	0	
37	Existing	16	30	-	e	31	0	-	
	Option 3	15	26	-1	e	28	0	0	
	Option 4	14	24	-2	e	27	0	0	
	Option 5	15	27	-1	e	28	0	0	
	Option 6	15	28	-1	e	28	0	0	
	Option 7	15	27	-1	e	27	0	0	
	Option 7 + Cumulative	15	25	-1	e	27	0	0	
38	Existing	15	27	-	e	29	0	-	
	Option 3	14	24	-1	e	27	0	0	
	Option 4	14	24	-1	e	27	0	0	
	Option 5	15	26	0	e	27	0	0	
	Option 6	15	26	0	e	28	0	0	
	Option 7	14	25	-1	e	27	0	0	
	Option 7 + Cumulative	14	23	-1	e	27	0	0	
39	Existing	15	25	-	e	28	0	-	
	Option 3	14	21	-1	e	27	0	0	
	Option 4	14	23	-1	e	27	0	0	
	Option 5	14	22	-1	e	26	0	0	
	Option 6	14	23	-1	e	28	0	0	
	Option 7	14	22	-1	e	26	0	0	
	Option 7 + Cumulative	13	21	-2	e	27	0	0	
40	Existing	13	20	-	e	25	0	-	
	Option 3	13	17	0	e	24	0	0	
	Option 4	13	18	0	e	24	0	0	
	Option 5	13	19	0	e	24	0	0	
	Option 6	13	20	0	e	25	0	0	
	Option 7	13	18	0	e	24	0	0	
	Option 7 + Cumulative	13	16	0	e	24	0	0	
41	Existing	11	10	-		21	0	-	
	Option 3	13	18	2	e	23	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 4	13	17	2	e	23	0	0	
	Option 5	12	16	1	e	23	0	0	
	Option 6	13	18	2	e	24	0	0	
	Option 7	12	16	1	e	23	0	0	
	Option 7 + Cumulative	12	13	1	e	24	0	0	
42	Existing	14	22	-	e	26	0	-	
	Option 3	15	25	1	e	27	0	0	
	Option 4	15	25	1	e	28	0	0	
	Option 5	14	24	0	e	27	0	0	
	Option 6	15	25	1	e	28	0	0	
	Option 7	14	24	0	e	27	0	0	
	Option 7 + Cumulative	14	22	0	e	27	0	0	
43	Existing	15	28	-	e	30	0	-	
	Option 3	14	25	-1	e	27	0	0	
	Option 4	15	27	0	e	28	0	0	
	Option 5	15	25	0	e	27	0	0	
	Option 6	15	27	0	e	28	0	0	
	Option 7	14	25	-1	e	26	0	0	
	Option 7 + Cumulative	15	26	0	e	27	0	0	
44	Existing	21	46	-	e	44	28	-	e
	Option 3	21	49	0	e	41	19	-9	e
	Option 4	21	47	0	e	40	20	-8	e
	Option 5	22	50	1	e	42	21	-7	e
	Option 6	22	50	1	e	41	18	-10	e
	Option 7	22	50	1	e	41	16	-12	e
	Option 7 + Cumulative	21	47	0	e	40	10	-18	e
45	Existing	15	25	-	e	32	0	-	
	Option 3	12	15	-3	e	25	0	0	
	Option 4	12	14	-3	e	24	0	0	
	Option 5	13	16	-2	e	26	0	0	
	Option 6	13	16	-2	e	26	0	0	
	Option 7	13	16	-2	e	26	0	0	
	Option 7 + Cumulative	12	13	-3	e	22	0	0	
46	Existing	16	29	-	e	35	0	-	
	Option 3	15	26	-1	e	31	0	0	
	Option 4	15	23	-1	e	30	0	0	
	Option 5	15	27	-1	e	31	0	0	
	Option 6	16	27	0	e	33	0	0	
	Option 7	15	27	-1	e	31	0	0	
	Option 7 + Cumulative	16	27	0	e	32	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
47	Existing	19	43	-	e	38	2	-	e
	Option 3	16	30	-3	e	32	0	-2	
	Option 4	16	29	-3	e	32	0	-2	
	Option 5	17	33	-2	e	33	0	-2	
	Option 6	17	31	-2	e	33	0	-2	
	Option 7	17	31	-2	e	32	0	-2	
	Option 7 + Cumulative	17	33	-2	e	32	0	-2	
48	Existing	17	33	-	e	32	0	-	
	Option 3	19	39	2	e	37	1	1	e
	Option 4	19	39	2	e	37	2	2	e
	Option 5	19	38	2	e	36	1	1	e
	Option 6	19	40	2	e	37	2	2	e
	Option 7	19	39	2	e	37	2	2	e
	Option 7 + Cumulative	19	39	2	e	37	1	1	e
49	Existing	18	40	-	e	35	0	-	
	Option 3	15	26	-3	e	30	0	0	
	Option 4	15	25	-3	e	30	0	0	
	Option 5	15	25	-3	e	29	0	0	
	Option 6	15	26	-3	e	31	0	0	
	Option 7	15	26	-3	e	30	0	0	
	Option 7 + Cumulative	15	26	-3	e	30	0	0	
50	Existing	15	25	-	e	28	0	-	
	Option 3	10	6	-5		20	0	0	
	Option 4	10	6	-5		20	0	0	
	Option 5	10	6	-5		20	0	0	
	Option 6	10	7	-5		20	0	0	
	Option 7	10	6	-5		20	0	0	
	Option 7 + Cumulative	11	10	-4		22	0	0	
51	Existing	14	23	-	e	26	0	-	
	Option 3	8	1	-6		15	0	0	
	Option 4	8	2	-6		15	0	0	
	Option 5	7	1	-7		15	0	0	
	Option 6	8	1	-6		15	0	0	
	Option 7	7	0	-7		15	0	0	
	Option 7 + Cumulative	7	0	-7		15	0	0	
52	Existing	11	10	-		24	0	-	
	Option 3	6	1	-5		17	0	0	
	Option 4	6	1	-5		17	0	0	
	Option 5	6	1	-5		17	0	0	
	Option 6	6	1	-5		17	0	0	
	Option 7	6	1	-5		18	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 7 + Cumulative	7	2	-4		17	0	0	
53	Existing	12	12	-	e	21	0	-	
	Option 3	10	6	-2		19	0	0	
	Option 4	11	10	-1		19	0	0	
	Option 5	10	4	-2		19	0	0	
	Option 6	10	7	-2		20	0	0	
	Option 7	10	6	-2		20	0	0	
	Option 7 + Cumulative	9	4	-3		19	0	0	
54	Existing	14	22	-	e	29	0	-	
	Option 3	9	2	-5		15	0	0	
	Option 4	9	3	-5		15	0	0	
	Option 5	8	1	-6		14	0	0	
	Option 6	8	1	-6		15	0	0	
	Option 7	9	3	-5		16	0	0	
	Option 7 + Cumulative	8	1	-6		14	0	0	
55	Existing	9	4	-		20	0	-	
	Option 3	9	6	0		22	0	0	
	Option 4	9	7	0		22	0	0	
	Option 5	9	6	0		21	0	0	
	Option 6	9	6	0		22	0	0	
	Option 7	9	6	0		22	0	0	
	Option 7 + Cumulative	8	4	-1		19	0	0	
56	Existing	15	23	-	e	28	0	-	
	Option 3	11	10	-4		23	0	0	
	Option 4	12	16	-3	e	23	0	0	
	Option 5	11	10	-4		23	0	0	
	Option 6	11	10	-4		23	0	0	
	Option 7	11	10	-4		23	0	0	
	Option 7 + Cumulative	11	10	-4		23	0	0	
57	Existing	14	22	-	e	30	0	-	
	Option 3	9	5	-5		20	0	0	
	Option 4	10	7	-4		20	0	0	
	Option 5	9	3	-5		18	0	0	
	Option 6	9	4	-5		19	0	0	
	Option 7	9	4	-5		19	0	0	
	Option 7 + Cumulative	8	2	-6		16	0	0	
58	Existing	11	10	-		21	0	-	
	Option 3	9	3	-2		17	0	0	
	Option 4	9	5	-2		17	0	0	
	Option 5	8	3	-3		18	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 6	8	3	-3		18	0	0	
	Option 7	9	3	-2		18	0	0	
	Option 7 + Cumulative	9	3	-2		17	0	0	
59	Existing	16	28	-	e	32	0	-	
	Option 3	11	10	-5		22	0	0	
	Option 4	12	14	-4	e	22	0	0	
	Option 5	10	7	-6		20	0	0	
	Option 6	11	10	-5		21	0	0	
	Option 7	11	10	-5		21	0	0	
	Option 7 + Cumulative	10	6	-6		19	0	0	
60	Existing	11	10	-		22	0	-	
	Option 3	13	15	2	e	27	0	0	
	Option 4	13	17	2	e	27	0	0	
	Option 5	12	12	1	e	25	0	0	
	Option 6	12	13	1	e	26	0	0	
	Option 7	12	13	1	e	26	0	0	
	Option 7 + Cumulative	11	10	0		23	0	0	
61	Existing	16	31	-	e	32	0	-	
	Option 3	11	10	-5		22	0	0	
	Option 4	11	10	-5		22	0	0	
	Option 5	10	6	-6		22	0	0	
	Option 6	10	6	-6		22	0	0	
	Option 7	10	8	-6		23	0	0	
	Option 7 + Cumulative	9	5	-7		22	0	0	
62	Existing	11	10	-		22	0	-	
	Option 3	7	1	-4		14	0	0	
	Option 4	8	1	-3		14	0	0	
	Option 5	7	1	-4		15	0	0	
	Option 6	7	1	-4		15	0	0	
	Option 7	7	1	-4		15	0	0	
	Option 7 + Cumulative	6	1	-5		15	0	0	
63	Existing	17	34	-	e	34	0	-	
	Option 3	15	27	-2	e	32	0	0	
	Option 4	16	30	-1	e	32	0	0	
	Option 5	16	27	-1	e	33	0	0	
	Option 6	16	29	-1	e	35	0	0	
	Option 7	16	30	-1	e	35	0	0	
	Option 7 + Cumulative	16	28	-1	e	31	0	0	
64	Existing	15	26	-	e	27	0	-	
	Option 3	15	25	0	e	28	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
	Option 4	17	33	2	e	30	0	0	
	Option 5	15	25	0	e	27	0	0	
	Option 6	16	29	1	e	29	0	0	
	Option 7	16	31	1	e	30	0	0	
	Option 7 + Cumulative	15	27	0	e	29	0	0	
65	Existing	14	22	-	e	30	0	-	
	Option 3	16	32	2	e	30	0	0	
	Option 4	18	39	4	e	30	0	0	
	Option 5	16	31	2	e	30	0	0	
	Option 6	16	33	2	e	30	0	0	
	Option 7	16	32	2	e	29	0	0	
	Option 7 + Cumulative	16	33	2	e	29	0	0	
66	Existing	10	6	-		18	0	-	
	Option 3	12	13	2	e	24	0	0	
	Option 4	13	17	3	e	24	0	0	
	Option 5	12	12	2	e	23	0	0	
	Option 6	12	13	2	e	24	0	0	
	Option 7	12	13	2	e	23	0	0	
	Option 7 + Cumulative	11	10	1		21	0	0	
67	Existing	11	10	-		22	0	-	
	Option 3	13	19	2	e	27	0	0	
	Option 4	14	24	3	e	27	0	0	
	Option 5	13	17	2	e	27	0	0	
	Option 6	13	19	2	e	28	0	0	
	Option 7	13	19	2	e	27	0	0	
	Option 7 + Cumulative	12	16	1	e	25	0	0	
68	Existing	13	18	-	e	22	0	-	
	Option 3	11	10	-2		22	0	0	
	Option 4	12	16	-1	e	22	0	0	
	Option 5	11	10	-2		23	0	0	
	Option 6	11	10	-2		24	0	0	
	Option 7	11	10	-2		23	0	0	
	Option 7 + Cumulative	11	10	-2		22	0	0	
69	Existing	12	17	-	e	25	0	-	
	Option 3	12	12	0	e	27	0	0	
	Option 4	13	16	1	e	27	0	0	
	Option 5	12	13	0	e	26	0	0	
	Option 6	12	13	0	e	27	0	0	
	Option 7	12	12	0	e	27	0	0	
	Option 7 + Cumulative	13	16	1	e	27	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
70	Existing	13	19	-	e	27	0	-	
	Option 3	12	13	-1	e	27	0	0	
	Option 4	14	23	1	e	27	0	0	
	Option 5	12	13	-1	e	27	0	0	
	Option 6	12	14	-1	e	27	0	0	
	Option 7	12	15	-1	e	28	0	0	
	Option 7 + Cumulative	16	31	3	e	30	0	0	

SUMMARY	Configurations	WIND COMFORT				WIND HAZARD			
		Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Total Hours	Hours Change	Total
	Existing	**13 mph**	**17%**	**-**	**47 / 70**	**25 mph**	**30 Hrs**	**-**	**2 / 70**
	Option 3	**12 mph**	**14%**	**-1**	**38 / 70**	**23 mph**	**20 Hrs**	**-10**	**2 / 70**
	Option 4	**12 mph**	**16%**	**-1**	**43 / 70**	**23 mph**	**22 Hrs**	**-8**	**2 / 70**
	Option 5	**12 mph**	**13%**	**-1**	**35 / 70**	**23 mph**	**22 Hrs**	**-8**	**2 / 70**
	Option 6	**12 mph**	**14%**	**-1**	**39 / 70**	**23 mph**	**20 Hrs**	**-10**	**2 / 70**
	Option 7	**12 mph**	**14%**	**-1**	**37 / 70**	**23 mph**	**18 Hrs**	**-12**	**2 / 70**
	Option 7 + Cumulative	**11 mph**	**13%**	**-2**	**31 / 70**	**22 mph**	**11 Hrs**	**-19**	**2 / 70**

Notes:

1) Wind Comfort = Wind speeds exceeding 11 mph for ≥ 10% of the time

2) Wind Hazard = Wind speeds exceeding 36 mph for ≥ 1 hour/year

APPENDIX I

Shadow Analysis Report

PREVISION DESIGN

APRIL 12, 2021
FINAL

SHADOW ANALYSIS REPORT FOR THE PROPOSED SFMTA POTRERO YARD PROJECT PER CEQA AND SAN FRANCISCO PLANNING SECTION 295 STANDARDS

FROM:
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PRINCIPAL
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CONTENTS

I. INTRODUCTION AND OVERVIEW

This report details the results of an analysis conducted by Prevision Design to identify the shadow effects that would be caused by the proposed construction of a 13-story, 150' tall (plus 10' stair and elevator penthouses), mixed-use project located at 2500 Mariposa Street ("the project") on Franklin Square. Franklin Square is a publicly accessible open space protected under Section 295 of the San Francisco Planning Code as well as subject to review for possible environmental impacts under the California Environmental Quality Act (CEQA).

The analysis was conducted according to criteria and methodology as described in (1) the February 3, 1989 memorandum titled "Proposition K – The Sunlight Ordinance" ("the 1989 memorandum") prepared by the San Francisco Recreation and Parks Department ("RPD") and the San Francisco Planning Department ("Planning"), (2) the July 2014 memorandum titled "Shadow Analysis Procedures and Scope Requirements" ("the 2014 memorandum") prepared by Planning, and (3) direction from current Planning and RPD staff regarding the appropriate approach, deliverables, and scope of analysis appropriate in consideration of the open spaces affected.

This report includes the results and discussion of all criteria factored into the analysis, including discussion of the analysis approach and methodology, a description and depictions of the project as proposed, description of the affected publicly accessible open space, and the results of the study, including quantitative and qualitative reporting of net new shadow generated by the project as well as graphical simulations of the location and extent of the project's net new shadow.

This report does not present opinions nor conclusions on the part of Prevision Design about whether or not the shadow from the proposed project could or should be considered significant/insignificant or whether the proposed project will have any adverse impact on the use of property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission because of the shading or shadowing that it will cause. These determinations shall be made by the San Francisco Planning Commission with input and recommendations from the RPD. ■

II. REGULATORY FRAMEWORK AND SIGNIFICANCE CRITERIA

While there are no specific federal nor state regulations which deal with solar access or shadow effects on publicly accessible open spaces, San Francisco has established several provisions, policies, and procedures that provide the framework by which shadow cast by proposed projects is evaluated.

San Francisco General Plan

The Recreation and Open Space Element of the City of San Francisco General Plan (2014) includes Policy 1.9 applicable to potential solar access or shading impacts of new development on public open spaces, excerpted below:

> *Solar access to public open space should be protected. In San Francisco, presence of the sun's warming rays is essential to enjoying open space. Climatic factors, including ambient temperature, humidity, and wind, generally combine to create a comfortable climate only when direct sunlight is present. Therefore, the shadows created by new development nearby can critically diminish the utility and comfort of the open space.*
>
> *Shadows are particularly a problem in downtown districts and in neighborhoods immediately adjacent to the downtown core, where there is a limited amount of open space, where there is pressure for new development, and where zoning controls allow tall buildings. But the problem potentially exists wherever tall buildings near open space are permitted.*
>
> *The City should support more specific protections elsewhere to maintain sunlight in these spaces during the hours of their most intensive use while balancing this with the need for new development to accommodate a growing population in the City.*

The project would be subject to evaluation of potential shadow effects on public spaces under the General Plan.

San Francisco Planning Code

Planning Code Section 295, adopted in 1984 pursuant to voter approval of Proposition K (The Sunlight Ordinance), prohibits the issuance of building permits for structures over 40 feet in height that would cast net new shadow on property under the jurisdiction of, or designated to be acquired by, the Recreation and Park Commission between one hour after sunrise to one hour before sunset at any time of year, unless the Planning Commission determines that the net new shadow (1) would not have an adverse impact

on the use of the property or (2) the impact would not be significant. Planning Code Section 295 provides that:

> *The City Planning Commission shall conduct a hearing and shall disapprove the issuance of any building permit governed by the provisions of this Section if it finds that the proposed project will have any adverse impact on the use of the property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission because of the shading or shadowing that it will cause, unless it is determined that the impact would be insignificant. The City Planning Commission shall not make the determination required by the provisions of this Subsection until the general manager of the Recreation and Park Department in consultation with the Recreation and Park Commission has had an opportunity to review and comment to the City Planning Commission upon the proposed project.*

Net new shadow cast by the project would affect an open space under the jurisdiction of the Recreation and Parks Department, so the provisions of Section 295 apply.

Other Local Regulations

Planning Code Sections 146 and 147, both added in 1985, establish additional design guidelines for buildings in C-3 Downtown Commercial, South of Market Mixed Use, and Eastern Neighborhoods Mixed Use Districts for the purpose of limiting shadow on public sidewalks, public plazas, and other publicly accessible spaces other than those protected under Section 295. Since the project site is in a Public zoning district, these regulations do not apply.

Environmental Impacts under CEQA

It is generally considered that implementation of a project would have significant impacts under CEQA if that project were to create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. ■

III. ANALYSIS METHODOLOGY

Technical Standards

The technical standards for evaluation of shadow effects follow the criteria adopted by the Recreation and Parks Commission and the Planning Commission adopted criteria in 1987 and 1989, as stated below:

> *Shadow is quantitatively measured by multiplying the area of the shadow by the amount of time the shadow is present on the open space, in units called square foot-hours (sfh). Determining the annual net new shadow load generated by a project begins with a calculation of the number of square foot-hours that would theoretically fall on a qualifying publicly accessible open space each day from an hour after sunrise to an hour before sunset summed over the course of a year, ignoring all shadow from any source. This total is referred to as the Theoretical Annual Available Sunlight (TAAS) for that park. The second step is the calculation of the baseline (or current) shading conditions, which factors in the square foot-hours of shadow cast by existing buildings and other structures on the open space. Lastly, the shadow effects of the project are calculated, with the difference between the baseline shadow condition and project shadow condition considered being net new project shadow. The amount of shadow is defined as the shadow in square foot-hours cast by the project divided by the TAAS, expressed as a percentage.*
>
> *Further, in addition to quantitative criteria, the adopted criteria set forth qualitative criteria for evaluation of shadow. Those criteria for assessing net new shadow are based on existing shadow profiles* [graphics]*, important times of day, important seasons in the year, location of the net new shadow, size, and duration of net new shadows and the public good served by buildings casting net new shadow.*

As there are not broadly established or accepted methodologies for technical evaluation of shadow effects under CEQA, so for review of shadow impacts on open spaces not subject to Section 295, Planning typically adapts these technical standards for use in evaluation of potential CEQA impacts. For this analysis, the San Francisco Planning Department has directed Prevision Design to use many of the standards for review of shadow under Section 295, as described in Section IV.

3D Modeling Assumptions

For the purposes of this analysis, Prevision Design has built a 3D computer model reflecting representation of the local San Francisco urban context and landform

surrounding the project generated by Light Intensity Distance and Ranging [or Laser Imaging Detection and Ranging] (LIDAR). This model reflective of actual building massing and articulation circa 2010, so for new buildings built[1] after that date, Prevision Design has generated individual building models using available architectural plans and records. Prevision Design also obtained or generated 3D models of reasonably foreseeable future projects[2] that would have the potential to generate additional net new shadow on the same publicly accessible open spaces that were shown to be affected by the project (cumulative condition projects)

Precise locations, boundaries, and sizes of the affected open spaces are input using on GIS data provided by Planning with input and boundary verification by RPD.

The model for the proposed project was provided to Prevision Design by the project architect on 12/11/2019 and reflects the project design as shown in the drawing set dated 11/20/2019. ■

IV. SCOPE OF WORK AND STUDIES PERFORMED

Initial Scoping Study

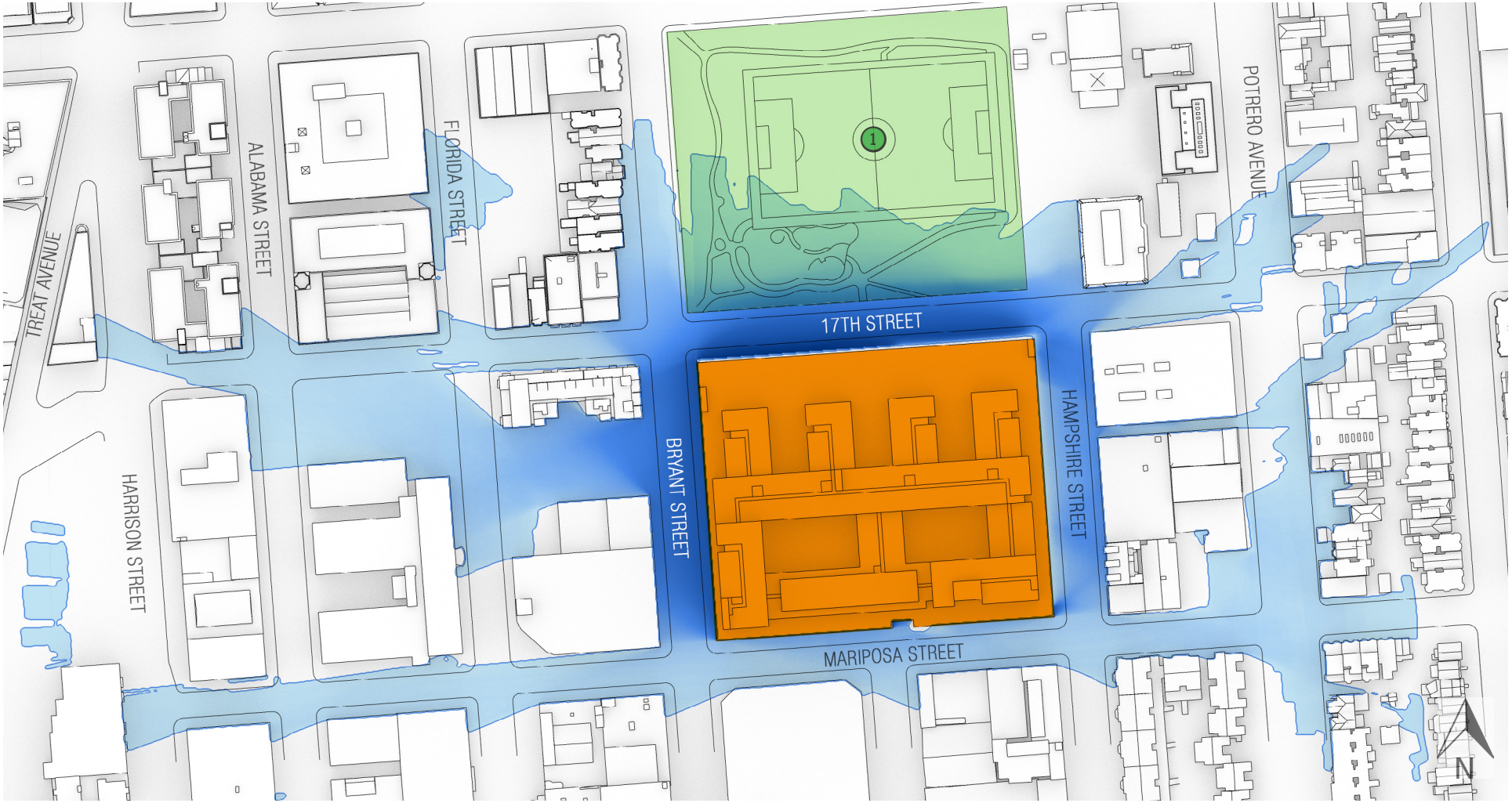
To establish the scope of review and approach to analysis and deliverables, Prevision Design followed the guidelines as encoded in the 1989 and 2014 memoranda, as modified for project-specific considerations via input and direction from Planning and RPD staff.

To determine the area and features that would be affected by net new project shadow, Prevision Design used the 3D context model to generate a full-year shadow fan diagram, which depicts all areas which would receive net new shadow (factoring in the presence of current, intervening shadow from existing buildings) between one hour after sunrise through one hour before sunset ("the daily analysis period") throughout the year. This diagram showing the extents of annual net new shadow was submitted to Planning on 3/24/2020. The shadow fan identified that Franklin Square would receive net new shadow from the project, as shown by Figure 1 (next page).

---

1 The final form of buildings currently under construction are included as if they are complete for the purposes of this study.

2 Qualifying cumulative projects are those that are currently in some stage of the planning or permitting process but have not yet been approved or have been approved but are not yet under construction.



Proposed Project

Net New Shadow Fan of Proposed Project

occasional shadow — frequent shadow

SHADOW FAN DIAGRAM
AFFECTED AREAS DURING SECTION 295 TIMES

FULL YEAR

Parks and Open Spaces (Jurisdiction)

1 Franklin Square Park (RPD)

FIGURE 1: Net New Shadow Fan and Affected Open Spaces

Prevision Design additionally generated a list of qualifying cumulative projects in the vicinity of this project which would be in sufficient proximity and/or location relative to Franklin Square to have the potential to cast net new shadow on this open space, listed below in Table 1.

CUMULATIVE PROJECT ADDRESS	PROJECT HEIGHT	PROJECT DESCRIPTION	DATE OF DESIGN DATA	PROJECT STATUS AS OF MARCH 3, 2021
2435-2445 16th Street	Approx. 78’	Seven stories with 53 residential units over ground floor commercial	12/5/2014	Building Permit Issued, not yet under construction. Planning Commission authorized a Large Project Authorization request and determined that the net new shadow cast by the Project on Franklin Square not be adverse to the use of Franklin Square.
1850 Bryant Street	Approx. 78’	Five stories with social services occupancy over ground floor retail	5/25/2017	Building Permit Issued, not yet under construction. Planning Commission authorized a Conditional Use Authorization request and determined that the net new shadow cast by the Project on Franklin Square not be adverse to the use of Franklin Square.
321 Florida Street	Approx. 108’	Nine stories with 169 residential units over ground floor PDR	5/18/2020	Planning Commission authorized a Large Project Authorization request and determined that the net new shadow cast by the Project on Franklin Square not be adverse to the use of Franklin Square.
333-353 Potrero Avenue	Approx. 68’	Horizontal and vertical addition to add 3 floors of commercial space to existing 2-story residential building	9/25/2019	Under Planning Department Review.

TABLE 1: Cumulative Project List

Prevision Design generated a scope of work and analysis methodology, which was submitted to Planning on 3/24/2020 and is discussed below:

Quantitative Calculations

Using the 3D project and urban context model developed as part of the scoping study, Prevision Design performed snapshot shadow measurements at 15-minute intervals within the daily analysis period, repeating these daily measurements every seven days between the Summer Solstice (June 21) and Winter Solstice (December 20), with interim times and dates extrapolated to approximate shadow conditions on other days and times. This half-year period (between the Summer and Winter Solstices) is referred to by Planning as a “solar year.” As the path of the sun is roughly mirrored over the second half of the year (December 21 through June 20), analysis of this half-year period allows for a reasonable extrapolation to arrive at a full-year estimated calculation of the

areas and durations of existing (baseline) shadow that currently falls on the affected open spaces.

In addition to the quantitative analysis of existing shadow conditions, calculations were generated to reflect the addition of the project, with the difference between the baseline conditions and those with the project representing the net new shadow effect.

Lastly, 3D models of the approved cumulative projects were added to the model to generate the baseline + project + cumulative scenario, depicting the reasonably foreseeable combined shadow effect of all projects in the current development pipeline.

The quantitative analysis calculations for this study as described above were performed for both the park as a whole as well as a breakout analysis of the specific effects on the children's play areas. The results of these calculations are included as Exhibits E and F.

Shadow Profile Graphics

To provide a spatial and contextual understanding of the location, size, and features affected by net new shadow, Prevision Design prepared graphics showing "snapshot" shadow profiles at hourly intervals over the entire area affected by the project. Graphics differentiate between existing shadow, net new project shadow, and cumulative condition shadow within the daily analysis period on the Summer Solstice (June 21), the approximate equinoxes (March 22/September 20), and the Winter Solstice (December 20) and the date with the greatest quantitative net new shadow for each affected open space (if different from above). These graphics appear as Exhibits B-D.

Qualitative Analysis

To gain an understanding of how net new shadow may affect existing patterns of use, Prevision Design conducted six 30-minute site visits to Franklin Square to observe the nature and intensity of uses. Two site visits were performed in the morning, two at midday, and two late in the day, with one visit from each pair on a weekday and one on a weekend.

The qualitative effects of net new shadow on the affected open spaces are discussed based on the size, timing, and duration of net new shadow and how such shadow might potentially affect observed existing patterns of use in Franklin Square. ■

SFMTA Potrero Yard Project

Franklin Square (RPD)

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-353 Potrero Avenue

FIGURE 2: Vicinity Map

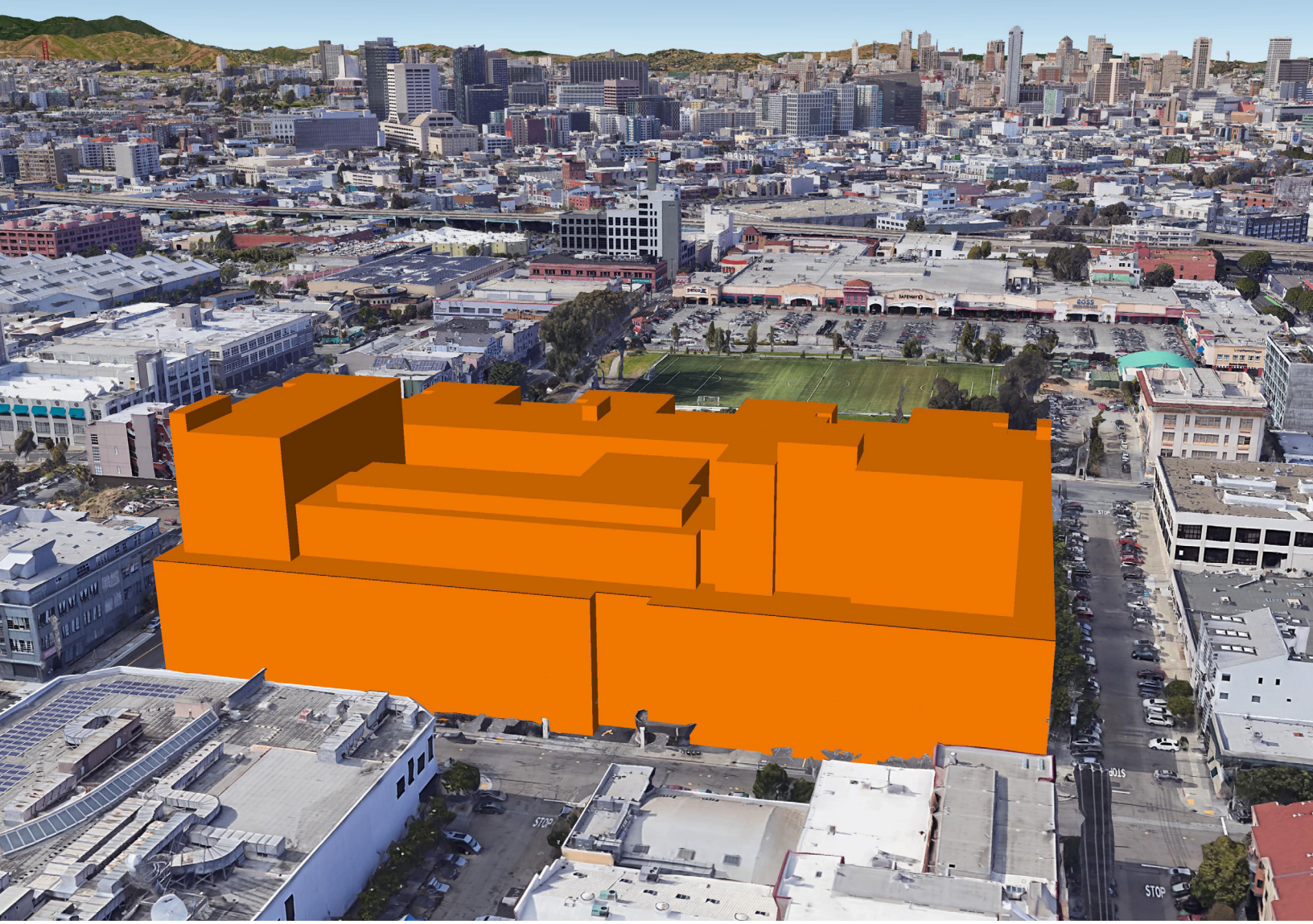


FIGURE 3: Project Massing

V. PROPOSED PROJECT

The SFMTA Potrero Yard project would be located on a 191,999-sf lot in the Mission neighborhood of San Francisco on Assessor's Block 3971, Lot 001. The site is located within the Public Zoning District, and a 65-X Height and Bulk District and is bounded by 17th Street to the north, Hampshire Street to the east, Mariposa Street to the south and Bryant Street to the west. The area surrounding the proposed project site is comprised primarily of a mix of residential, commercial and PDR uses, with most buildings in the vicinity between 2 and 9 stories in height.

The project site is currently occupied by the existing transit facilities, including a large, low building on the east portion of the site and parking lots on the west portion. The grade elevation of the development changes for approximately 27 feet from the lowest southwest corner to the highest northeast corner. Figure 2 shows the location of the proposed project.

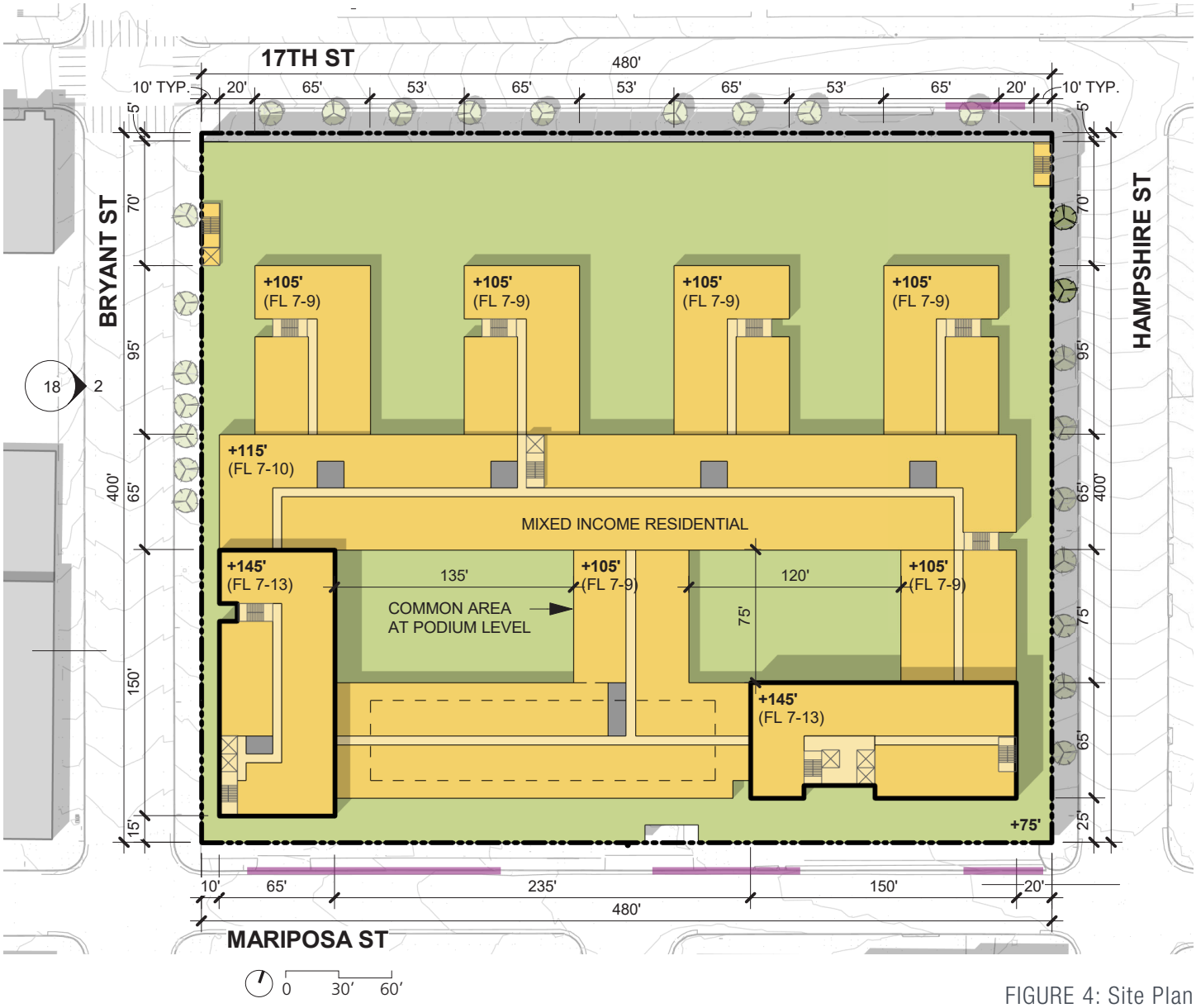


FIGURE 4: Site Plan

The proposed project would consist of redeveloping the current transit facilities into a multi-use site that would include residential and commercial uses and a bus facility and may include open spaces on the podium. The podium would be 75 feet above Mariposa Street, including primarily the proposed bus maintenance facility, administration, commercial use and mixed-income housing. Above the podium would be the proposed mixed income housing from Floor 7 to Floor 13. The tallest building elements would be located near the southwest and southeast corners of the site, for a total height of approximately 150 feet (plus 10' additional height at stair/elevator penthouses) above grade along Mariposa Street. Public areas around the development site would include building entrances, sidewalks surrounding the site, Franklin Square to the immediate north and potentially podium open spaces at Floor 7 of the proposed development.

Figure 3 shows a rendering depicting the proposed project's massing, Figure 4 shows a proposed site plan, and Figures 5 and 6 show the proposed street elevations. ■

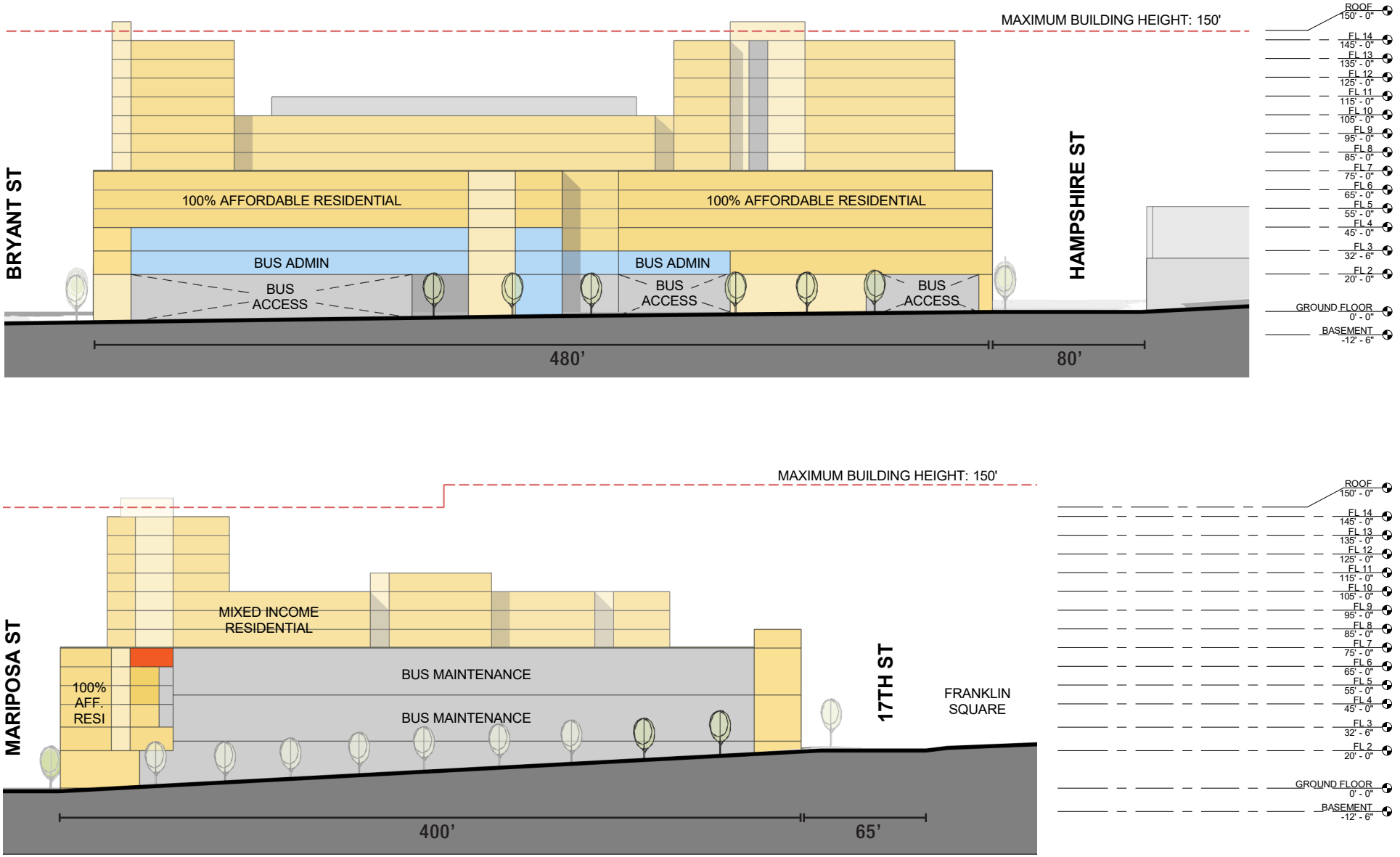


FIGURE 5: Mariposa (Top) and Hampshire (Bottom) Street Elevations

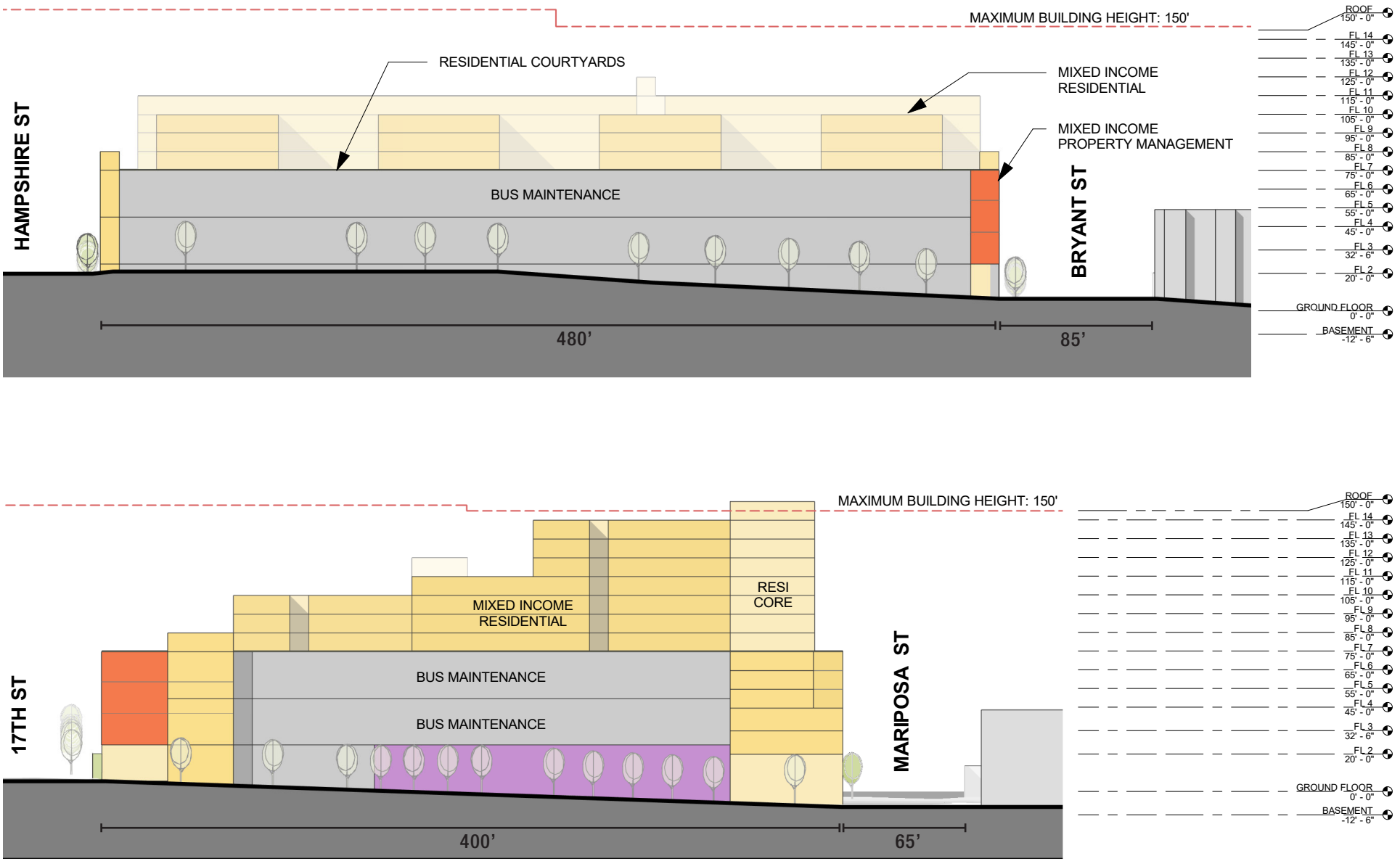


FIGURE 6: 17th (Top) and Bryant (Bottom) Street Elevations

FIGURE 7: Franklin Square Overview

VI. AFFECTED PARKS AND OPEN SPACES

FIGURE 8: Adult Fitness Area

Franklin Square

Franklin Square is a public park under the jurisdiction of the Recreation and Park Commission. It is a 4.44 acre (193,327 sf) urban park located in the Mission neighborhood of San Francisco on Assessor's Block 3963 / Lot 001. It is bounded by 16th Street to the north, 17th Street to the south, Hampshire Street to the east, and Bryant Street to the west. Aside from the soccer field area, the park is not fenced, but the official hours of operation are from 5am to 12 am (midnight). The official park website is https://sfrecpark.org/Facilities/Facility/Details/Franklin-Square-335.

As shown by Figure 7, the park contains grassy and landscaped areas, paved walkways and benches around the perimeter, an adult fitness area (Figure 8), a children's play area (Figure 9) near the southwest corner of the park and features a large soccer field (Figure 10) located in the center of the park area. The park is elevated above the surrounding streets and is primarily comprised of open grassy areas punctuated by

FIGURE 9: Children's Play Area

FIGURE 10 : Soccer Field

FIGURE 11: Park Pathways

1 Park Entry
2 Children's Play Area
3 Soccer Fields
4 Landscape/Grassy Areas
5 Pedestrian Pathway
6 Adult Fitness Area

FIGURE 12: Franklin Square Map

approximately thirty-five trees, which range from saplings to fully mature large with dense canopies which are clustered along the western edge of the park (Figure 11) as well as the southeastern corner. The principal park stairway entries are located on the corners of 16th and Bryant and 17th and Bryant as well as mid-block entry (including an ADA entry) located mid-block along 17th street. Figure 12 shows a diagram of Franklin Square.

Other Nearby Parks and Open Spaces

The proposed project does not have the potential to affect any other public parks or privately owned open spaces in the project vicinity. ■

VII. FRANKLIN SQUARE ANALYSIS FINDINGS

Table 2 summarizes the existing condition data and quantitative shadow effects of the proposed project on Franklin Square. The full quantitative calculations for shadow conditions on all 27 analysis dates are included as Exhibit E.

Existing Conditions

The park area is 193,327 square feet and currently has 9,812,985 annual square-foot-hours (sfh) of shadow. Based on a theoretical annual available sunlight (TAAS) of 719,447,382 sfh, the park's current annual shadow load is 1.36%. Under existing conditions, shadow is cast primarily on along the eastern and western sides of the park during early morning and late afternoon timeframes, respectively. Most of the park is unshaded throughout the middle of the day year-round.

Increase in Shadow from Proposed Project

The proposed project would result in net new shadow falling on the park, adding approximately 11,956,912 net new annual sfh of shadow and increasing the annual shadow load by 1.66% above current levels, which would result in a new annual total shadow load of 3.02%.

Timing and Location of Net New Shadow from Proposed Project

Net new shadow from the proposed project would occur annually between approximately September 14 through March 28 and fall on most of the southern half of Franklin Square. Over the course of the affected period, net new shadow would be cast throughout the day. As shown by Figure 13, the times of year which would be most affected by project shadow would be during fall and winter in the mornings (between 8-10:30 a.m.).

The days of maximum net new square foot hours of shadow on the park due to the proposed project would occur on December 20 and 21st, when the proposed project's shadow would sweep across portions of the southern half of Franklin Square starting at 8:19 a.m. (the beginning of the daily analysis period) through 3:54 p.m. (the end of the daily analysis period) affecting pathways, landscape/grass areas, the adult fitness

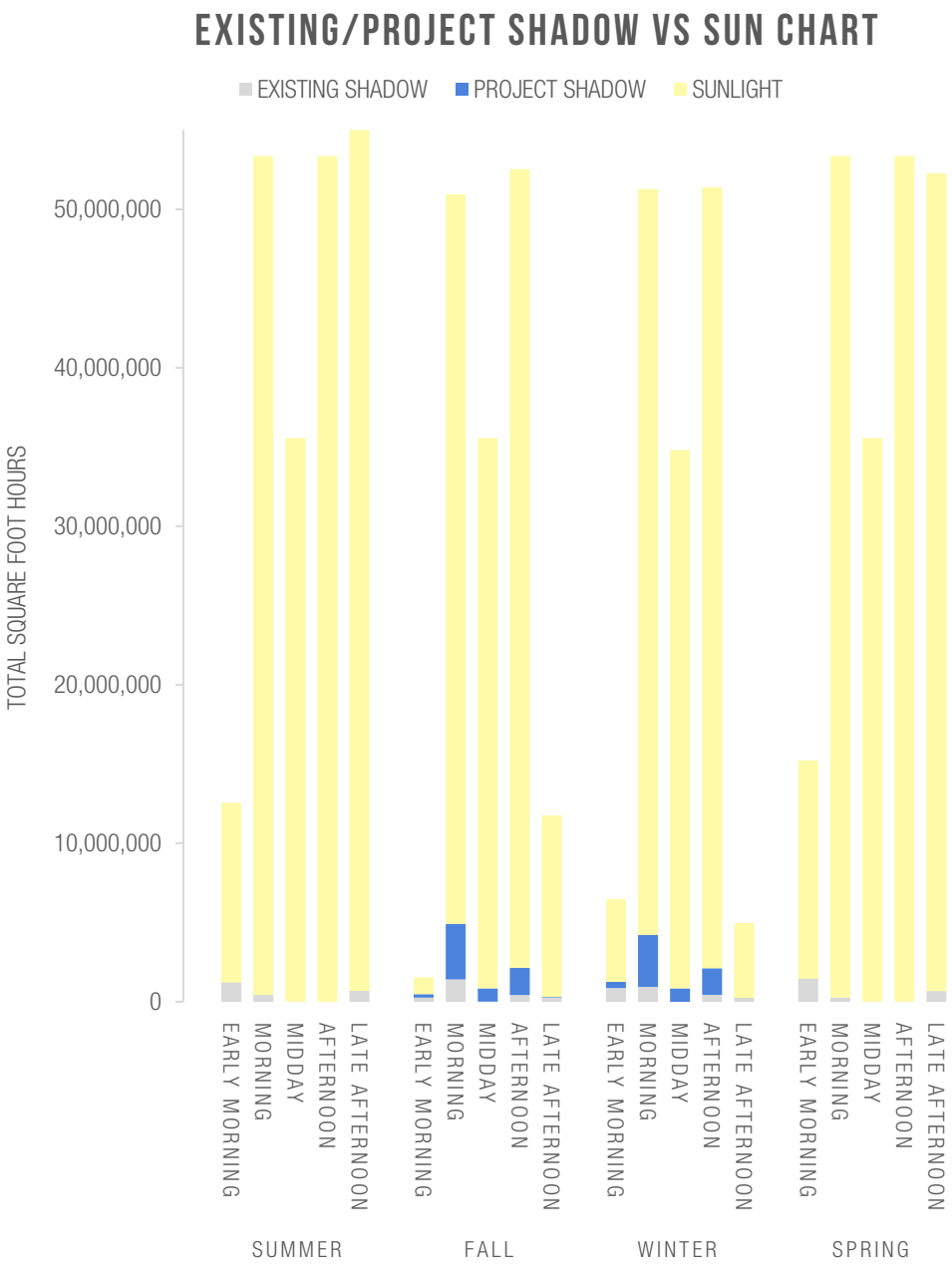
THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS) CALCULATION	FRANKLIN SQUARE
Total plan area of Franklin Square	4.44 acres (193,327 sf)
Total hours of annual sunlight from 1-hr after sunrise through 1-hr before sunset	3721.4 hrs
Theoretical Annual Available Sunlight (plan area x hours of annual sunlight)	719,447,382 sfh

EXISTING SHADOW CONDITIONS SUMMARY	FRANKLIN SQUARE
Total annual existing shadow load (existing shadow sfh ÷ TAAS sfh)	1.36%
Total annual existing shadow in square-foot-hours (sfh)	9,812,985 sfh
Range in existing shadow area coverage throughout the year	Between 0% - 26%
Time of year / time of day most affected by existing shadow	Fall / Early Morning (before 8:00 AM)

SFMTA POTRERO YARD NET NEW SHADOW SCENARIO SUMMARY	FRANKLIN SQUARE
Annual net new project-only shadow load / total existing + project shadow load	1.66% / 3.02%
Annual net new sfh project shadow / total existing + project sfh	11,956,912 sfh / 21,769,897 sfh
Number of days annually when new shading from project would occur	Up to 196 days a year
Dates when net new shadow from project would be cast annually	September 14 - March 28
Date(s) with most annual sfh net new project shadow (shadow load / net new sfh)	December 20 & December 21
Time of year / time of day most affected by project net new shadow overall	Fall / Morning (8:00-11:00 AM)
Date(s) with largest shadow area from the project (area and time shadow occurs)	Dec 20/Dec 21 (56,153 sf @ 8:19 AM)
Range in project net new shadow percentage coverage (area range)	Between 0% - 29% (0 - 56,153 sf)
Average project net new shadow coverage on affected dates (shadow area)	6.12% (11,826 sf)
Date(s) with the longest duration of net new shadow (duration)	Oct 25/Feb 15 (8 hr 48 min +/- 0 min)
Range in daily project net new shadow duration (margin of error)	Between zero minutes up to 8 hr 48 min (+/- 0 min)
Average daily project net new shadow duration on affected dates	6 hr 13 min

CUMULATIVE NET NEW SHADOW SCENARIO SUMMARY	FRANKLIN SQUARE
Annual net new cumulative condition shadow load / total existing + cumulative shadow load	2.01% / 3.37%
Annual net new sfh cumulative shadow / total existing + cumulative sfh	14,469,398 sfh / 24,282,383 sfh
Number of days annually when new shading from cumulative would occur	Year-round
Dates when net new shadow from cumulative would be cast annually	All
Date(s) with most annual sfh net new cumulative shadow (shadow load / net new sfh)	December 20 & December 21
Time of year / time of day most affected by cumulative net new shadow overall	Fall / Morning (8:00-11:00 AM)
Date(s) with largest shadow area from the cumulative (area and time shadow occurs)	Dec 20/Dec 21 (56,153 sf @ 8:19 AM)
Range in cumulative net new shadow percentage coverage (area range)	Between 0% - 29% (0 - 56,153 sf)
Average cumulative net new shadow coverage on affected dates (shadow area)	6.45% (12,474 sf)
Date(s) with the longest duration of net new shadow (duration)	Oct 25/Feb 15 (8 hr 48 min +/- 0 min)
Range in daily cumulative net new shadow duration (margin of error)	Between 54 min up to 8 hr 48 min (+/- 0 min)
Average daily cumulative net new shadow duration on affected dates	3 hr 51 min

TABLE 2: Quantitative shadow breakdown for Franklin Square



SUMMER: Jun 21-Sep 20
FALL: Sep 21-Dec 20
WINTER: Dec 21-Mar 20
SPRING: Mar 21-Jun 20

EARLY MORNING: Before 8 a.m.
MORNING: 8 a.m. to 10:30 a.m.
MIDDAY: 10:30 a.m. to 1:30 p.m.
AFTERNOON: 1:30 p.m. to 4 p.m.
LATE AFTERNOON: After 4 p.m.

FIGURE 13: Sun and Shadow Levels by Time of Day and Season

area, the children's play area and a small portion of the soccer field.

The dates with the single largest net new shadow area would also occur on December 20/21 when a 56,153-sf new shadow would be cast at 8:19 a.m. (see Figure 14, next page).

The duration of proposed project-generated net new shadow would also vary throughout the year, with net new shadow lasting up to 8 hours and 48 minutes (occurring on October 25 and February 15th).

Increase in Shadow under Cumulative Conditions

Cumulative net new shadow from the proposed project combined with the other planned projects in the vicinity would result in an increase of 14,469,398 sfh of shadow on the park, or an additional 2,512,486 sfh as compared to an increase from the proposed project alone. This increase in sfh would result in total cumulative net new shadow load of 2.01%. The increase in shadow load relative to the project alone would be 0.35%. Table 2 additionally includes a breakdown of net new shadow for the cumulative shadow scenario.

FIGURE 14: Max net new project shadow on Franklin Square (Dec 20/21 at 8:19 am)

Timing and Location of Net New Shadow Under Cumulative Conditions

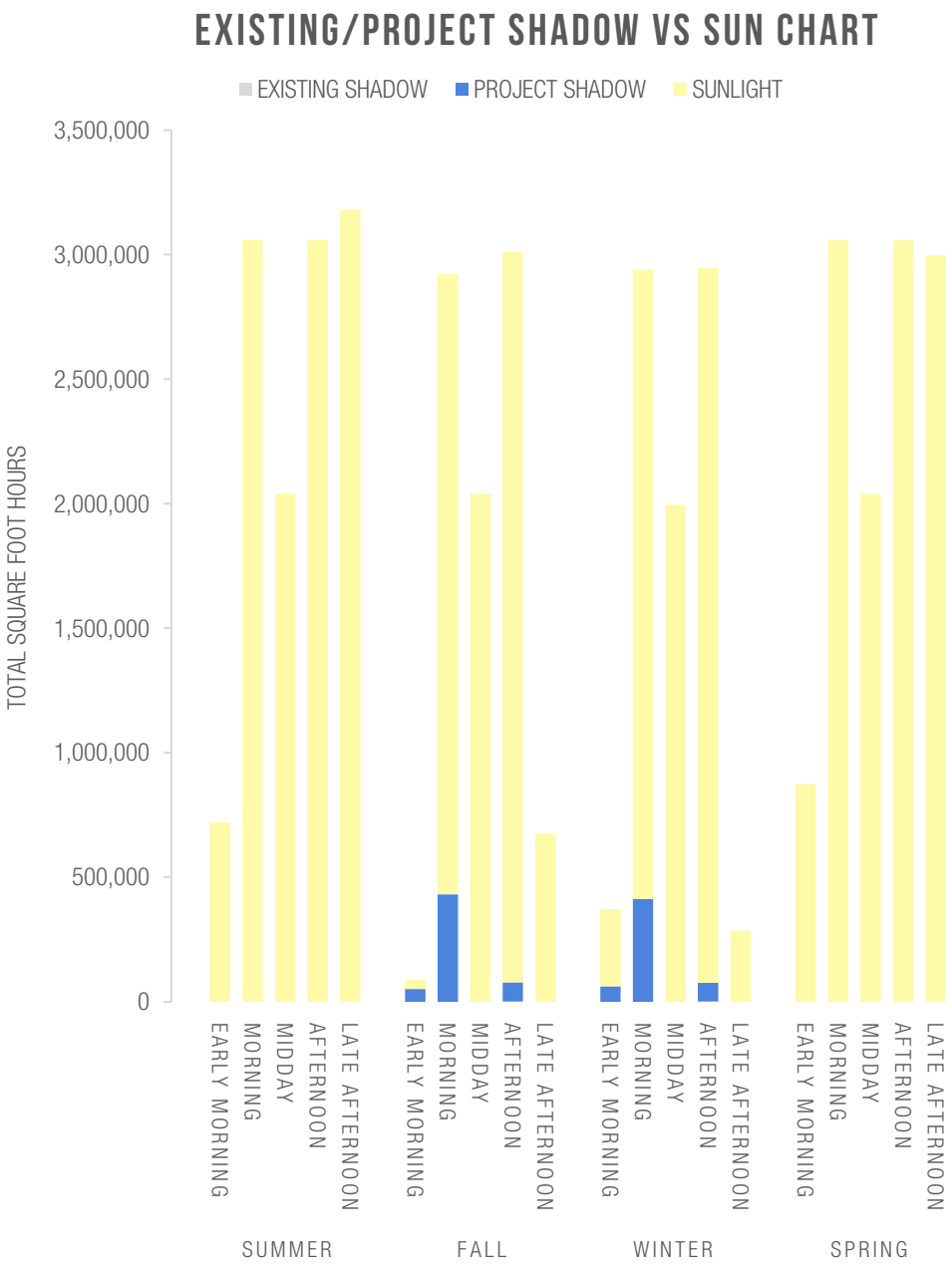
Net new shadow under cumulative conditions would occur year-round with additional shadow cast across the northeastern portion of the park during afternoon hours.

The days of maximum net new square foot hours of shadow on the park would also occur December 20th and 21st, when cumulative condition shadow would fall across the southern half of Franklin Square throughout the day, affecting pathways, landscape and grass areas, the adult fitness area, the children's play area and portions of the soccer field. Additional shadow from the 321 Florida Street cumulative project would also fall in the late afternoon across the northwestern corner of the park affecting pathways, landscape and grass areas, and a small portion of the soccer field.

The dates with the single largest net new shadow and date of longest shadow duration area due to cumulative conditions would be the same as the project conditions,

Net New Shadow Effects on Children's Play Area

NOTE: While portions of parks are not typically broken out for individual analysis, due to the large size of the park overall relative to the smaller area of the children's play area where higher levels of project net new shadow would be cast, Planning has requested an additional focused analysis on this feature.



SUMMER: Jun 21-Sep 20
FALL: Sep 21-Dec 20
WINTER: Dec 21-Mar 20
SPRING: Mar 21-Jun 20

EARLY MORNING: Before 8 a.m.
MORNING: 8 a.m. to 10:30 a.m.
MIDDAY: 10:30 a.m. to 1:30 p.m.
AFTERNOON: 1:30 p.m. to 4 p.m.
LATE AFTERNOON: After 4 p.m.

FIGURE 15: Playground Sun and Shadow Levels by Time of Day and Season

As shown on Table 3 (next page), the children's playground area is 11,075 square feet and currently has 3,237 annual square-foot-hours (sfh) of shadow. Based on a theoretical annual available sunlight (TAAS) of 41,214,393 sfh, the children's playground area's current annual shadow load is 0.01%. Under existing conditions, the children's play area is predominantly unshaded throughout the day, with only very small amounts of shadow occurring around the edge of the play area in the early morning or late afternoon.

The proposed project would result in net new shadow falling on the children's playground area, adding approximately 1,027,201 net new annual sfh of shadow and increasing the annual shadow load by 2.49% above current levels, which would result in a new annual total shadow load of 2.50%.

Net new shadow from the proposed project would occur annually between approximately September 28 through March 14 and affect all parts of the children's playground area. Over the course of the affected period, net new shadow would be cast during a morning and occasionally an afternoon period but would not affect the playground during midday hours. As shown by Figure 15, the times of year which would be most affected by project shadow would be during fall and winter during in the mornings (between 8-10:30 a.m.).

The days of maximum net new square foot hours of shadow on the children's

THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS) CALCULATION	FRANKLIN SQUARE PLAYGROUND ONLY
Total plan area of Franklin Square Playground Only	0.25 acres (11,075 sf)
Total hours of annual sunlight from 1-hr after sunrise through 1-hr before sunset	3721.4 hrs
Theoretical Annual Available Sunlight (plan area x hours of annual sunlight)	41,214,393 sfh

EXISTING SHADOW CONDITIONS SUMMARY	FRANKLIN SQUARE PLAYGROUND ONLY
Total annual existing shadow load (existing shadow sfh ÷ TAAS sfh)	0.01%
Total annual existing shadow in square-foot-hours (sfh)	3,237 sfh
Range in existing shadow area coverage throughout the year	Between 0% - 4%
Time of year / time of day most affected by existing shadow	Summer / Early Morning (before 8:00 AM)

SFMTA POTRERO YARD NET NEW SHADOW SCENARIO SUMMARY	FRANKLIN SQUARE PLAYGROUND ONLY
Annual net new project-only shadow load / total existing + project shadow load	2.49% / 2.50%
Annual net new sfh project shadow / total existing + project sfh	1,027,201 sfh / 1,030,438 sfh
Number of days annually when new shading from project would occur	Up to 168 days a year
Dates when net new shadow from project would be cast annually	September 28 - March 14
Date(s) with most annual sfh net new project shadow (shadow load / net new sfh)	December 20 & December 21
Time of year / time of day most affected by project net new shadow overall	Fall / Morning (8:00-11:00 AM)
Date(s) with largest shadow area from the project (area and time shadow occurs)	Nov 22/Jan 18 (11,075 sf @ 7:57 AM)
Range in project net new shadow percentage coverage (area range)	Between 0% - 100% (0 - 11,075 sf)
Average project net new shadow coverage on affected dates (shadow area)	30.67% (3,396 sf)
Date(s) with the longest duration of net new shadow (duration)	Dec 20/Dec 21 (5 hr 20 min +/- 14 min)
Range in daily project net new shadow duration (margin of error)	Between zero minutes up to 5 hr 20 min (+/- 14 min)
Average daily project net new shadow duration on affected dates	2 hr 28 min

CUMULATIVE NET NEW SHADOW SCENARIO SUMMARY	FRANKLIN SQUARE PLAYGROUND ONLY
Annual net new cumulative condition shadow load / total existing + cumulative shadow load	2.99% / 3.00%
Annual net new sfh cumulative shadow / total existing + cumulative sfh	1,230,674 sfh / 1,233,912 sfh
Number of days annually when new shading from cumulative would occur	Up to 349 days a year
Dates when net new shadow from cumulative would be cast annually	3/23 - 9/19 & 9/28 - 3/14
Date(s) with most annual sfh net new cumulative shadow (shadow load / net new sfh)	December 20 & December 21
Time of year / time of day most affected by cumulative net new shadow overall	Fall / Morning (8:00-11:00 AM)
Date(s) with largest shadow area from the cumulative (area and time shadow occurs)	Nov 22/Jan 18 (11,075 sf @ 7:57 AM)
Range in cumulative net new shadow percentage coverage (area range)	Between 0% - 100% (0 - 11,075 sf)
Average cumulative net new shadow coverage on affected dates (shadow area)	33.14% (3,670 sf)
Date(s) with the longest duration of net new shadow (duration)	Dec 20/Dec 21 (5 hr 20 min +/- 14 min)
Range in daily cumulative net new shadow duration (margin of error)	Between zero minutes up to 5 hr 20 min (+/- 14 min)
Average daily cumulative net new shadow duration on affected dates	1 hr 22 min

TABLE 3: Quantitative shadow breakdown for Franklin Square Playground

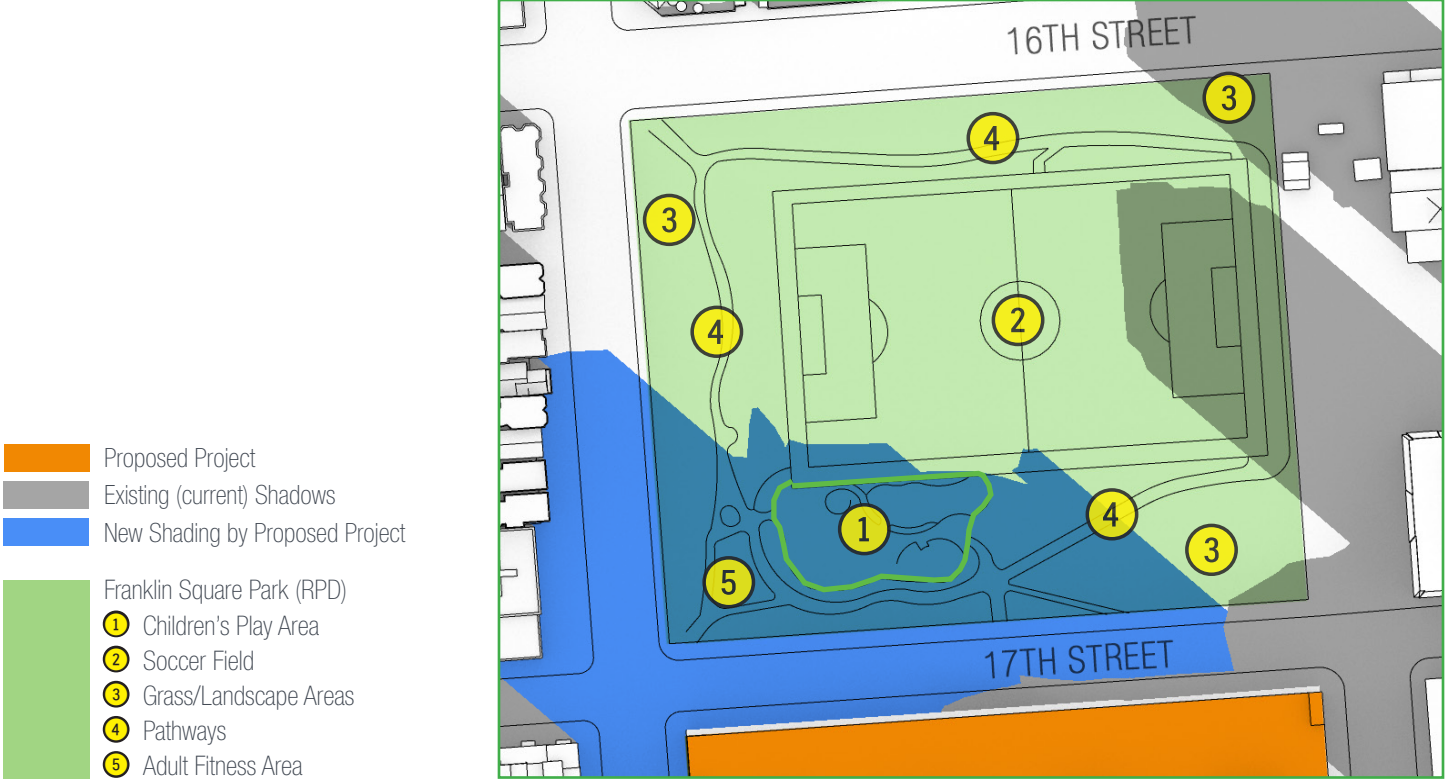


FIGURE 16: Max net new project shadow on Franklin Square Playground (Dec 20/21 at 8:30 am)

playground area due to the proposed project would occur on December 20 and 21st, when the proposed project's shadow would affect the entire children's playground area starting at 8:19 a.m. (the beginning of the daily analysis period) through approximately 11:15 a.m. then again starting at approximately 1:45 p.m. through 3:54 p.m. (the end of the daily analysis period). Net new shadow would cover the entire play area prior to 8:45 a.m. then recede southward throughout the rest of the morning affected period but only the southern portion of the playground area during the afternoon affected period.

The dates with the single largest net new project shadow area would also occur on December 20/21 when an 11,075-sf new shadow would be cast at 8:30 a.m. (see Figure 16). The duration of proposed project-generated net new shadow would also vary throughout the year, with net new shadow lasting up to approximately 5 hours and 20 minutes (also occurring on December 20/21). As shown on Table 3 (next page), the children's playground area is 11,084 square feet and currently has 8,532 annual square-foot-hours (sfh) of shadow. Based on a theoretical annual available sunlight (TAAS) of 41,248,146 sfh, the children's playground area's current annual shadow load is 0.02%. Under existing conditions, the children's play area is predominately unshaded throughout the day, with only very small amounts of shadow occurring around the edge of the play area in the early morning or late afternoon.

The proposed project would result in net new shadow falling on the children's playground area, adding approximately 1,026,693 net new annual sfh of shadow and increasing the annual shadow load by 2.49% above current levels, which would result in a new annual total shadow load of 2.51%.

Net new shadow from the proposed project would occur annually between approximately September 28 through March 14 and affect all parts of the children's playground area. Over the course of the affected period, net new shadow would be cast throughout the day. As shown by Figure 12, the times of year which would be most affected by project shadow would be during fall and winter during in the mornings (between 8-10:30 a.m.).

The days of maximum net new square foot hours of shadow on the children's playground area due to the proposed project would occur on December 20 and 21st, when the proposed project's shadow would affect the entire children's playground area starting at 8:19 a.m. (the beginning of the daily analysis period) through approximately 11:15 a.m. then again starting at approximately 1:45 p.m. through 3:54 p.m. (the end of the daily analysis period). Net new shadow would affect the entire play area during the early portions of the morning affected period but only the southern portion of the playground area during the afternoon affected period.

The dates with the single largest net new project shadow area would also occur on December 20/21 when a 50,468-sf new shadow would be cast at 8:30 a.m. (see Figure 13). The duration of proposed project-generated net new shadow would also vary throughout the year, with net new shadow lasting up to approximately 5 hours and 20 minutes (also occurring on December 20/21).

Cumulative net new shadow from the proposed project combined with the other planned projects in the vicinity would result in an increase of 1,230,674 sfh of shadow on the children's play area, or an additional 203,473 sfh as compared to an increase from the proposed project's net new shadow alone. This increase in sfh would result in total cumulative net new shadow load of 2.99%. The increase in shadow load relative to the project alone would be 0.50%. Table 3 additionally includes a breakdown of net new shadow for the cumulative shadow scenario.

Observed Uses of Franklin Square Park

Within the six 30-minute observation periods conducted by Prevision Design on February 27th and March 1st, 2020, the number of users present in the park over the course of half an hour ranged from 39 to 176 people. The two principal destinations of park users appeared to be the soccer field and the children's play area. Users of the soccer field (both as game participants and observers) accounted for most park users across all observations--between half and three quarters of all users of Franklin square. The children's play area was also observed to be used across all visits, from a low count of one user on the weekday afternoon visit to a high of 18 users (six adults and 12 children) observed on the weekend morning visit. Other areas of the park such as the pathways, lawns and landscaped areas and adult fitness areas were less actively used or used for transitory purposes such as walking to the soccer field or for jogging. Observed

peak use on March 1st corresponded to a ratio of 1,098 sf of park area per user. See Table 4 for a park observation summary and Table 4A for a breakout of these totals detailing only the children's playground users.

OBSERVATION TIME	DATE OF VISIT	PARK USERS	TEMP - WEATHER
Weekday Morning	2/27/2020	39	54° F – Mostly Cloudy
Weekday Midday	2/27/2020	48	62° F – Mostly Cloudy
Weekday Afternoon	2/27/2020	124	66° F – Mostly Cloudy
Weekend Morning	3/1/2020	176	50° F – Mostly Cloudy
Weekend Midday	3/1/2020	159	53° F – Cloudy
Weekend Afternoon	3/1/2020	106	56° F – Cloudy

TABLE 4: Franklin Square Park Use Observations

OBSERVATION TIME	DATE OF VISIT	PLAYGROUND USERS	TEMP - WEATHER
Weekday Morning	2/27/2020	5	54° F – Mostly Cloudy
Weekday Midday	2/27/2020	11	62° F – Mostly Cloudy
Weekday Afternoon	2/27/2020	1	66° F – Mostly Cloudy
Weekend Morning	3/1/2020	18	50° F – Mostly Cloudy
Weekend Midday	3/1/2020	13	53° F – Cloudy
Weekend Afternoon	3/1/2020	5	56° F – Cloudy

TABLE 4A: Children's Playground Use Observations

Overall, observed peak use at the park occurred during weekend morning and midday hours. The observed intensity of use varied between the observation times but could be characterized as high for the soccer field, moderate for the children's playground (See Table 4A) and low for other park features.

While not directly observed by Prevision Design, based on a survey conducted by RPD the New School (K-12 school) uses Franklin Square for outdoor recreation activities on a regular basis during weekdays for up to 4 hours/day. Additionally, Sweet Peas Preschool (2730 17th Street) and Project Commotion (2095 Harrison Street) are nearby preschools that use the park almost daily.

The Value of Sunlight

The portions of Franklin Square that would likely be sensitive to the addition of new shadow would be those elements that are fixed in location, conducive to more stationary activities (users remain in one area rather than pass through) and are observed to be well used by the public. Based on the use observations performed, the children's play area would likely qualify as the most sensitive area per the criteria established above.

All of the children's play area would receive additional net new shadow from the project at certain times, as further discussed below.

Project Shadow Characteristics

Throughout the year, net new shadow due to the proposed project would occur in the southern half of the park (see Exhibit A), with net new shadow (when occurring) being present for up to a maximum duration of 8 hours and 48 minutes. The largest net new shadow area would be 50,468 sf, representing approximately 26% of the total park area. The date(s) which have the maximum amount of net new shadow throughout the day are December 20th & 21st where shadows would be present across the southwestern corner of the park at 8:19 a.m. and move across the park from west to east (while also retreating to the south until midday, then encroaching northward throughout the afternoon).

The children's play area would receive morning shadow from the project during the early morning period, with shadow leaving the area no later than 11am then returning at around 2pm and sweeping across the southwest corner of the playground through the afternoon. A small corner of the soccer field would be affected for a shorter duration, 30 minutes or less also at the beginning of the daily analysis period. Based on use observations, the children's playground was used across all observation visits, with slightly elevated usage around the morning and midday periods as compared to the afternoon observation visits, so it is likely that the presence of new shadow would be noticed by users of the park particularly during the morning periods across the affected fall and winter dates. Soccer field usage was observed to be high during the weekend observation, however the small area affected would not have had a likely effect on the uses observed.

The landscape and grassy areas as well as the adult fitness area along the southern edge of the park would receive more project shadow and for a longer duration, however these areas were observed to have substantially lower levels of use and could be characterized as somewhat less sensitive to the addition of net new shadow due to the observed levels and nature of their uses.

Exhibits B through D graphically illustrate shadow conditions at hourly intervals throughout the day between the Section 295 analysis times at the Summer Solstice (June 21), approximate Vernal and Autumnal Equinoxes (March 22 / September 20), and the Winter Solstice / Day of Maximum Net New Shadow (December 20).

Cumulative Condition Shadow Characteristics

Throughout the year, net new cumulative shadow would occur in areas affected by the project but additionally along the western third of the park primarily due to the proposed 321 Florida Street project (and to a very small extent the 2435-2445 16th Street project). This additional net new cumulative shadow (when occurring) would fall in the western 1/3 of the park, would be present for 55 minutes on average and would last for up to a maximum duration of one hour and 11 minutes. The largest net new shadow area attributable to the 321 Florida St would be 26,903 sf, representing approximately 14% of the total park area. Shadow from 1850 Bryant Street would also reach the park but only affect a very small area in the southwestern corner of the park during winter afternoons for less than one hour.

With respect to the more sensitive receptor areas, additional net new shadows from cumulative projects would encroach on western edge of the park around 6:15 p.m. reach the edge of the children's play area around 7pm and would affect up to half of the play area for approximately half an hour (between this time and the end of the daily analysis period). Afternoon observation periods showed reduced activity at this time of day but as shadows from existing development are also moving toward the playground at this time, visitors to the playground area during this time of day would experience the addition of cumulative shadow as the arrival of shadow on portions of the playground 20-30 minutes earlier than experienced under current conditions.

The western edge of the soccer field would also receive additional net new cumulative shadow, but for a short duration (15 minutes or less) in the late afternoon or early evening. Due to the short duration and small area affected, it is unlikely this shadow would affect the uses on the field as observed. ■

EXHIBIT A: AGGREGATE SHADOWFAN DIAGRAM

A1 - Annual net new shadow locations from the proposed project

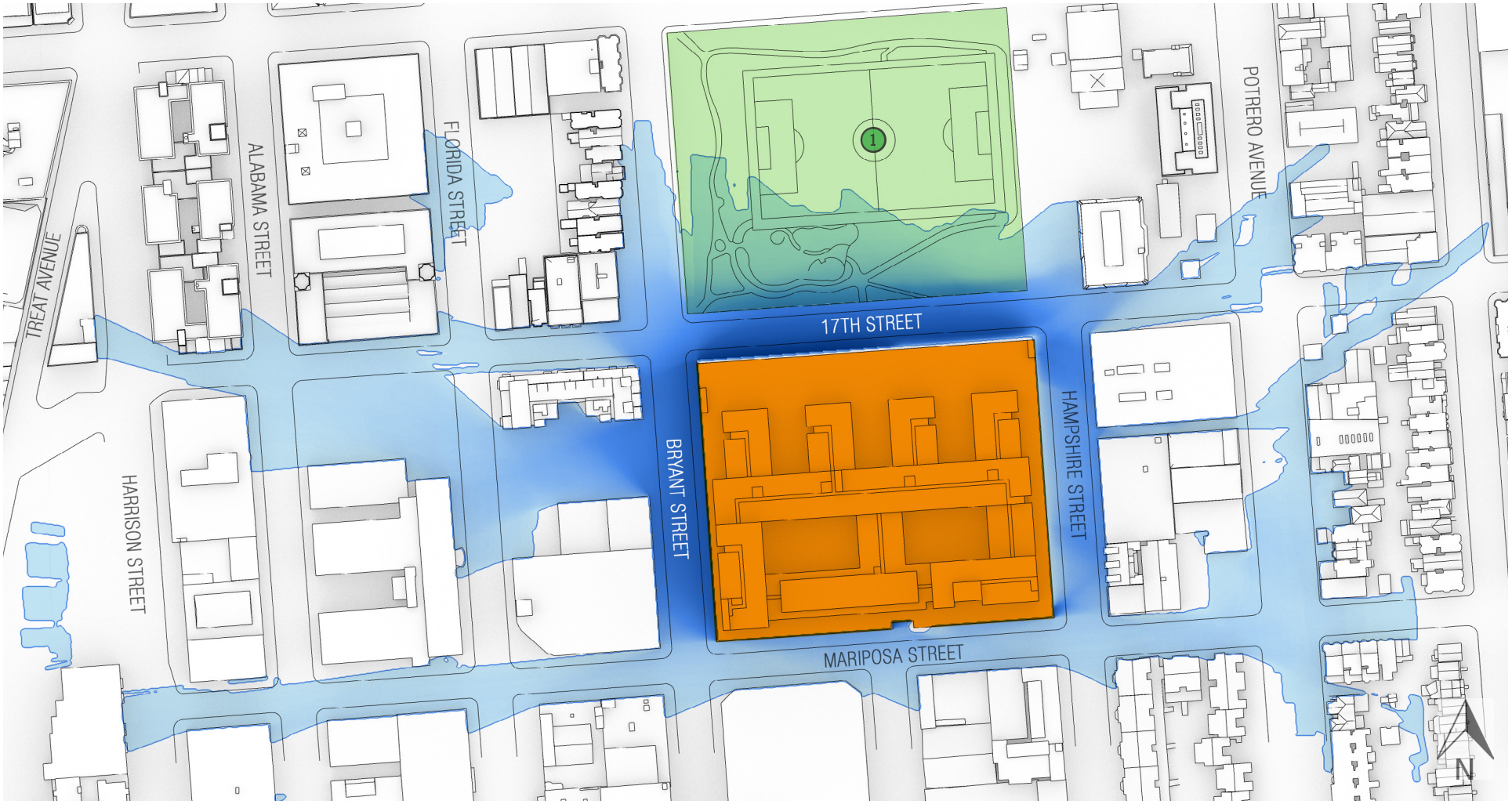
Diagram showing extents of all areas receiving net new shadow from the proposed project at *some* point during the year.

A1

SFMTA POTRERO YARD

Full year net new shadow fan diagram factoring in the presence of existing shadows

PREVISION DESIGN



Proposed Project

Net New Shadow Fan of Proposed Project

occasional shadow — frequent shadow

SHADOW FAN DIAGRAM AFFECTED AREAS DURING SECTION 295 TIMES

FULL YEAR

Parks and Open Spaces (Jurisdiction)

1 Franklin Square Park (RPD)

EXHIBIT B: SHADOW DIAGRAMS ON SUMMER SOLSTICE

B1 - June 21

Diagrams at one hour intervals starting one hour after sunrise to one hour prior to sunset.

PREVISION DESIGN

B1.1 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

6:46 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

B1.2 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

7:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.3 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

8:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

B1.4 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

9:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.5 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

10:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.6 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

11:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.7 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

12:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.8 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

1:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.9 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

2:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.10 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

3:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.11 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

4:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

B1.12 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

5:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.13 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

6:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.14 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE
JUNE 21

7:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

B1.15 SFMTA POTRERO YARD

Shadow diagrams on the Summer Solstice

SUMMER SOLSTICE JUNE 21

7:36 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)

1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects

1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

EXHIBIT C: SHADOW DIAGRAMS NEAR EQUINOXES

C1 - September 20 (Autumnal), March 22 (Vernal) similar

Diagrams at one hour intervals starting one hour after sunrise to one hour prior to sunset.

PREVISION DESIGN

C1.1 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

7:57 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.2 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

8:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

C1.3 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

9:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.4 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

10:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.5 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

11:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.6

SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

12:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

C1.7 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

1:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

C1.8 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

2:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.9

SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

3:00 PM

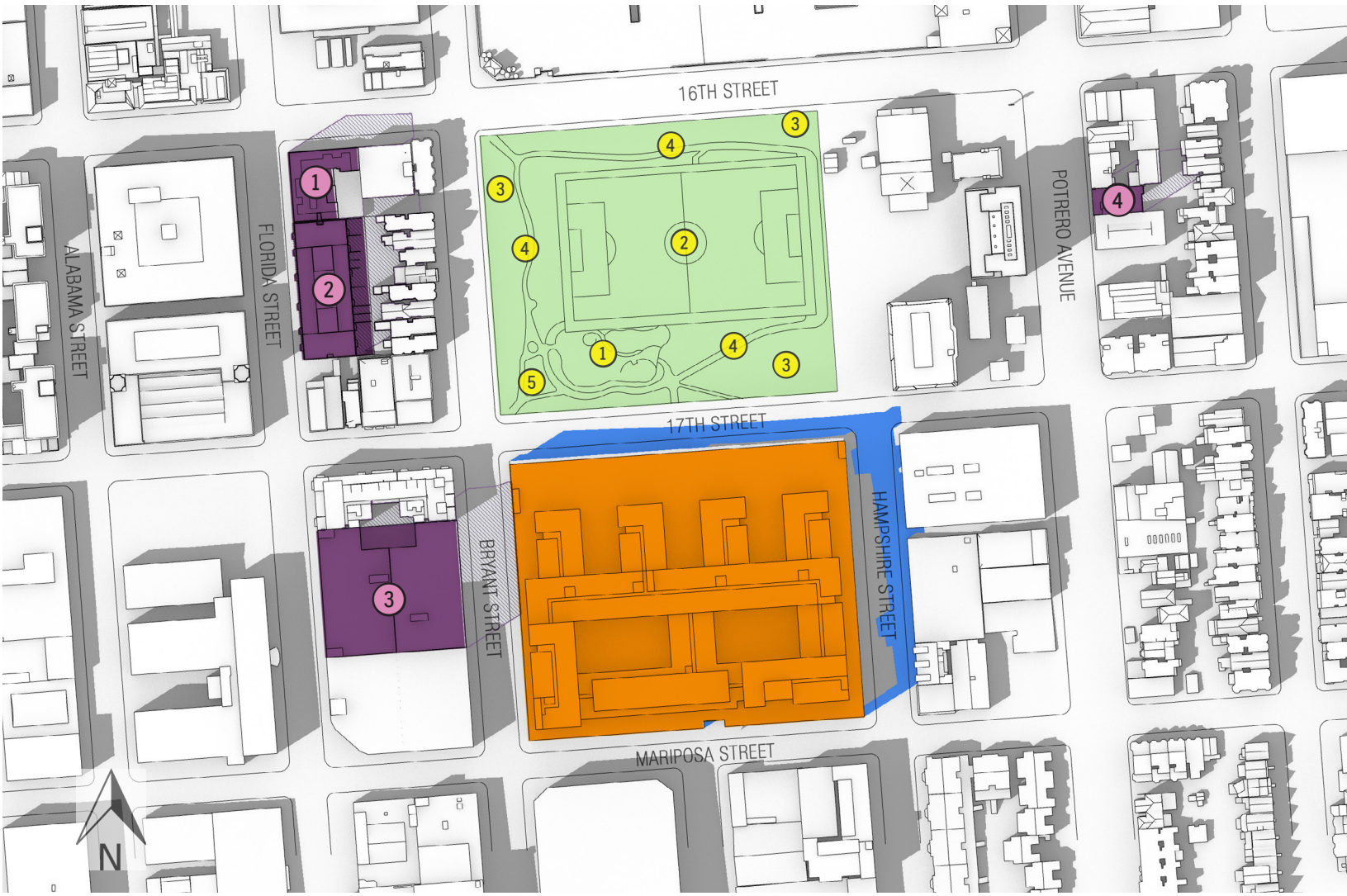
- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.10 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)



FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

4:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

C1.11 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

5:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

C1.12 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

6:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

C1.13 SFMTA POTRERO YARD

Shadow diagrams on the Fall Equinox (Spring sim)

FALL EQUINOX (SPRING SIM)
SEPTEMBER 20 & MARCH 22

6:09 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

EXHIBIT D: SHADOW DIAGRAMS ON WINTER SOLSTICE (ALSO DATE OF MAX NET NEW SHADOW)

D1 - December 20/21

Diagrams at one hour intervals starting one hour after sunrise to one hour prior to sunset plus additional graphics provided at 15-minute intervals at times shadow is present in the park..

PREVISION DESIGN

D1.1 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

8:19 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.2 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

8:30 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.3 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

8:45 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.4 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

9:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.5 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

9:15 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.6 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

9:30 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.7 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

9:45 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.8 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

10:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.9 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

10:15 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.10 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

10:30 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.11 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

10:45 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.12 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

11:00 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.13 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

11:15 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.14 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

11:30 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

D1.15 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

11:45 AM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.16 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

12:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.17 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

12:15 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.18 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

12:30 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.19 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

12:45 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.20 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

1:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.21 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

1:15 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

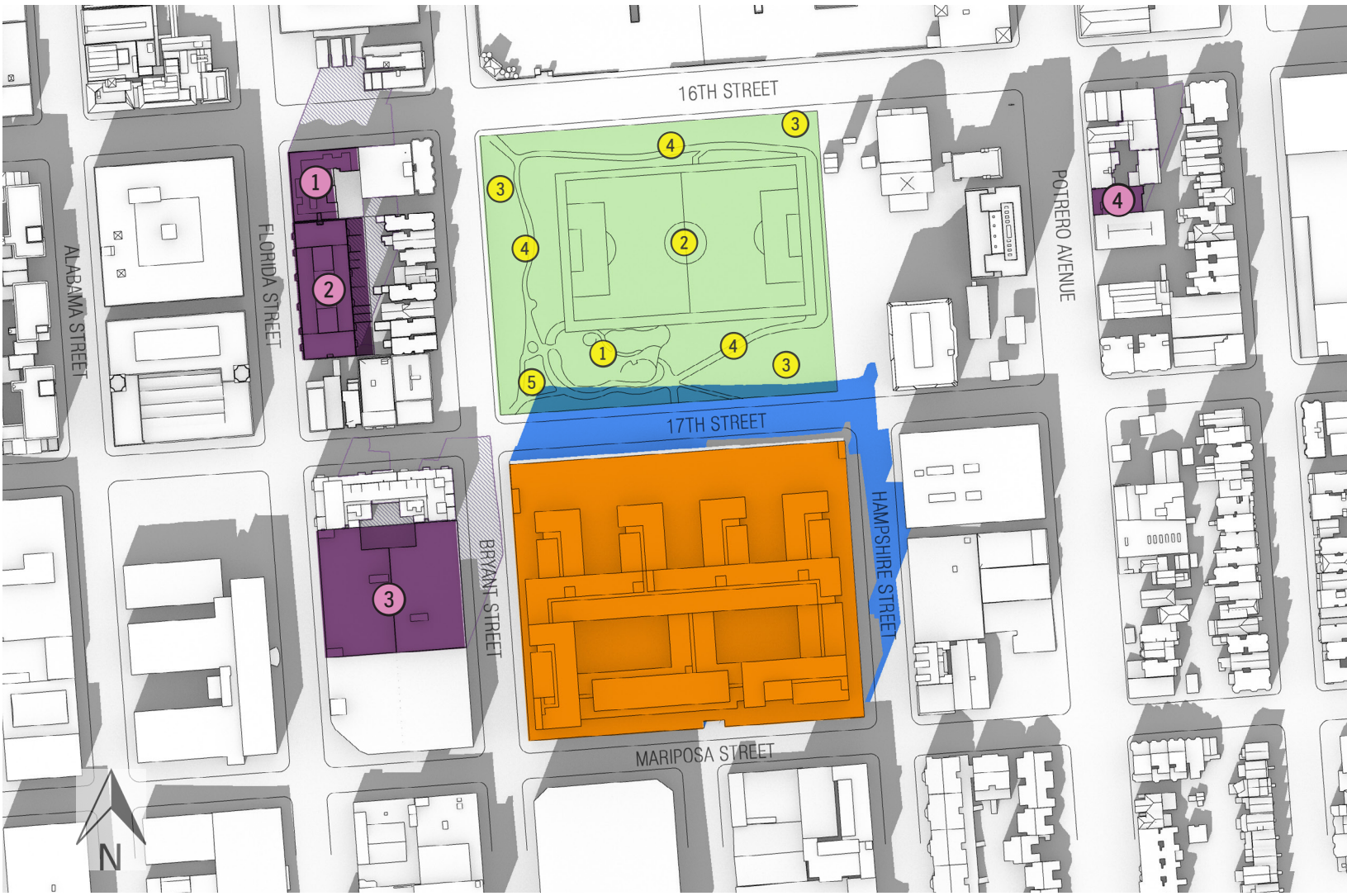
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.22 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

1:30 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

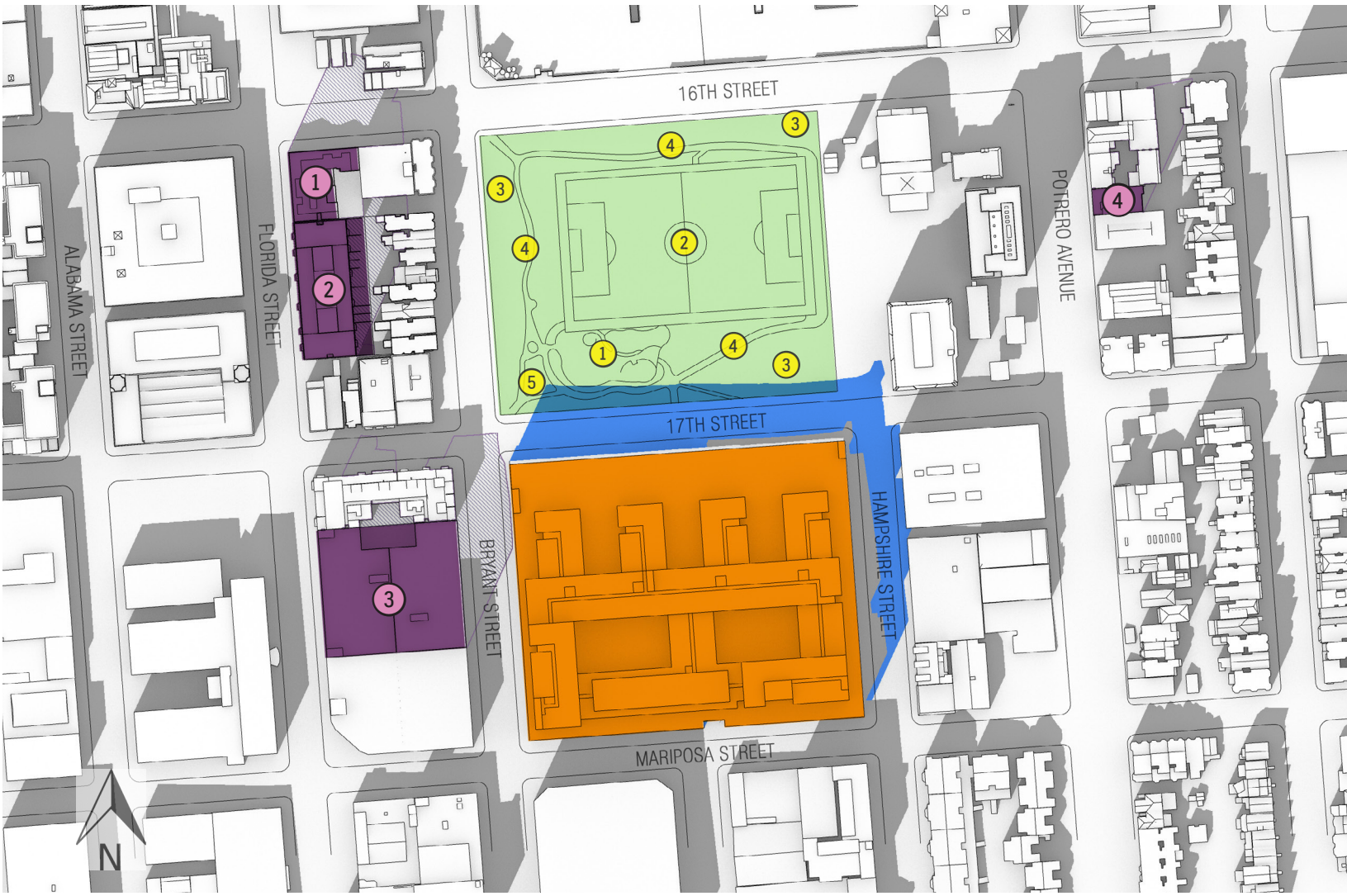
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.23 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

1:45 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

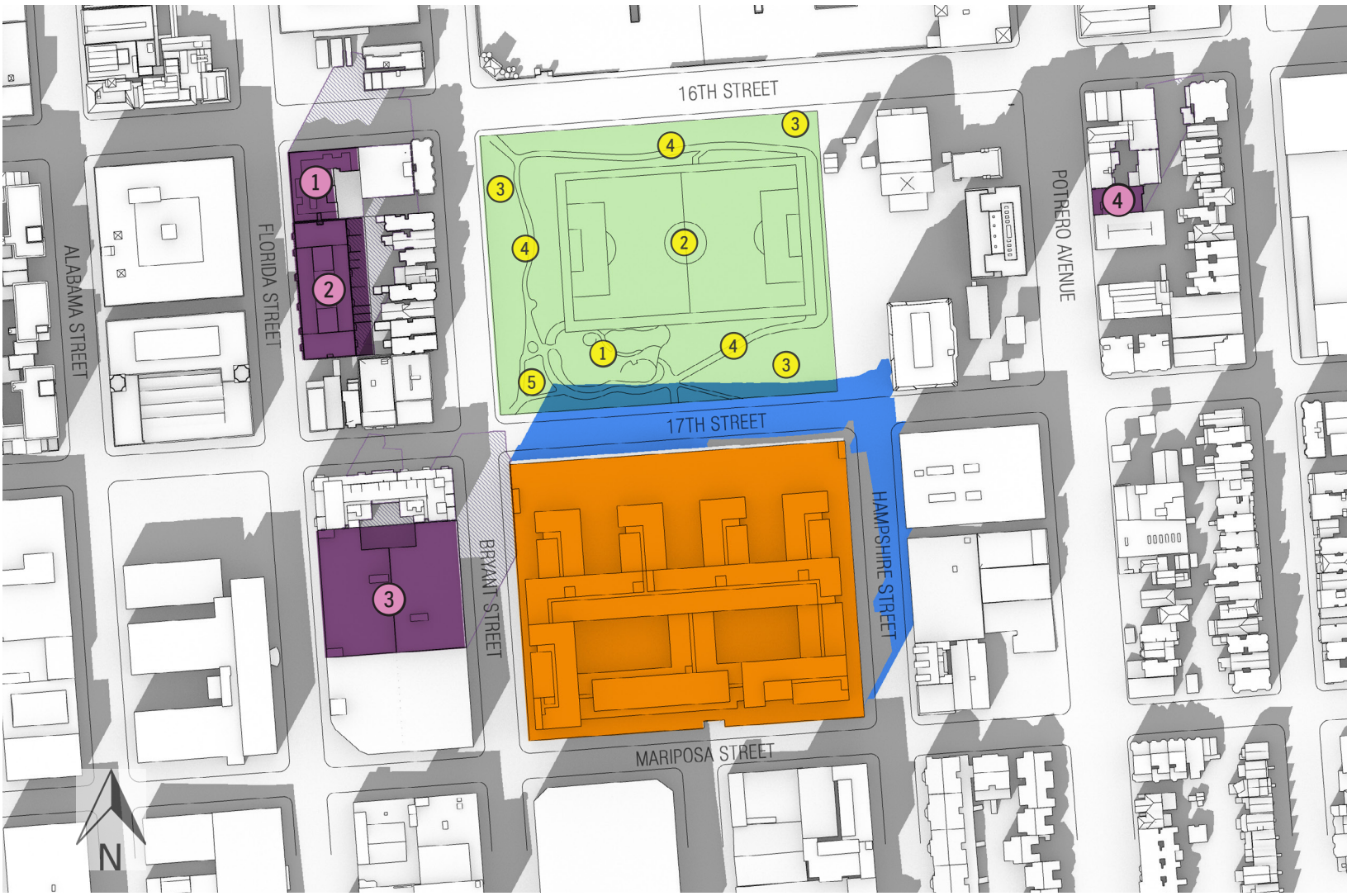
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.24 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

2:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

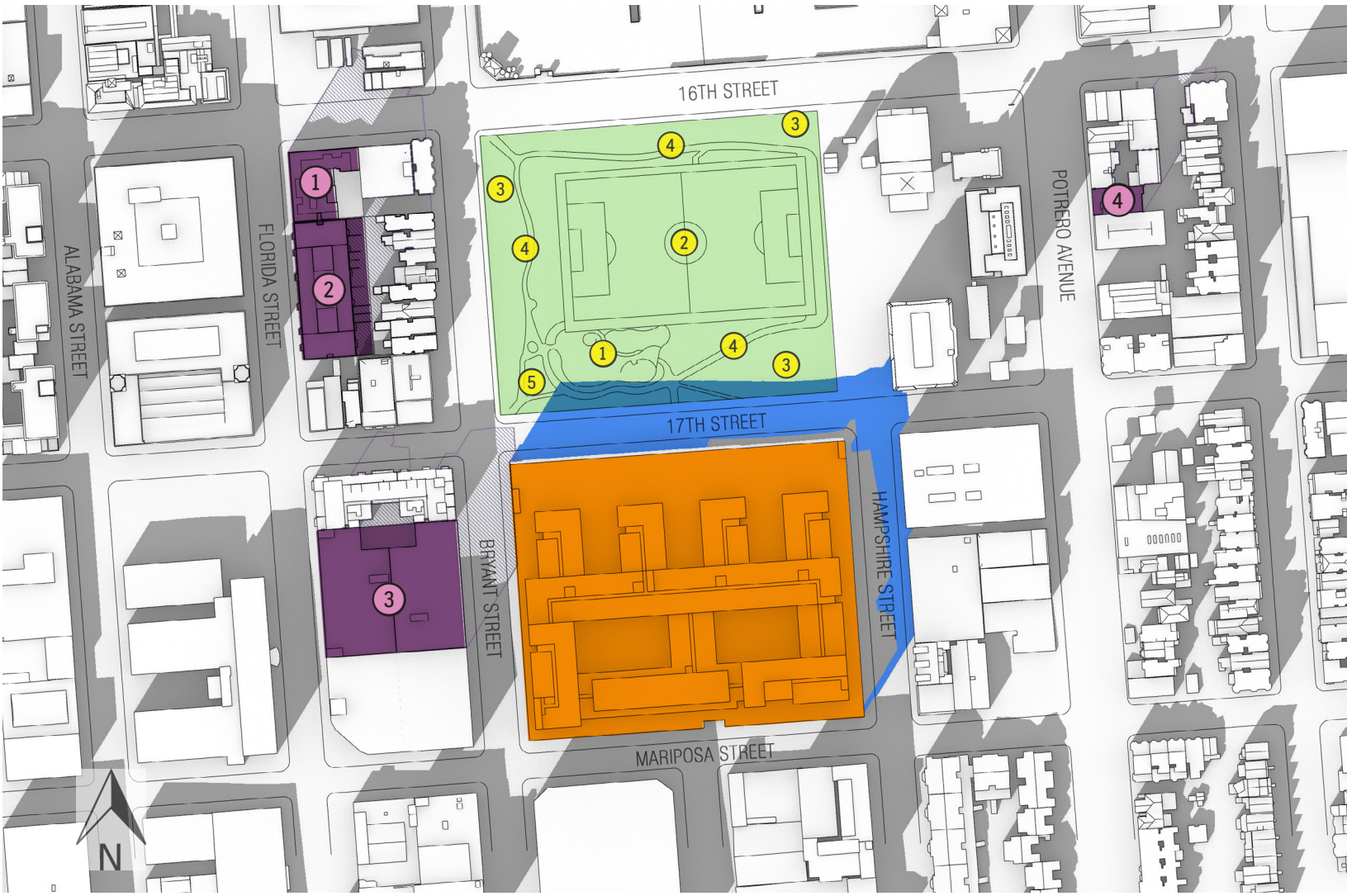
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.25 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

2:15 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

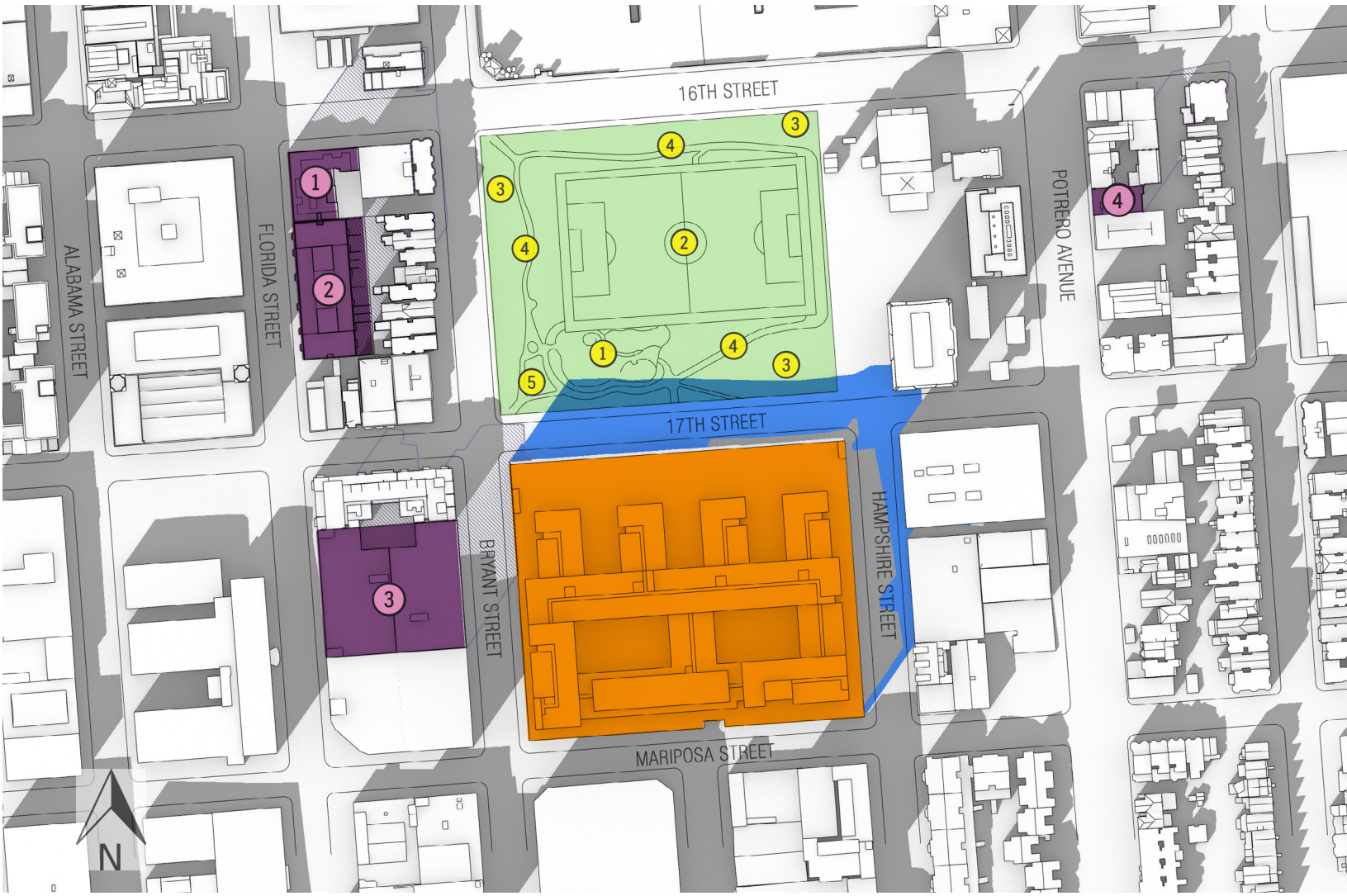
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.26 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

2:30 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

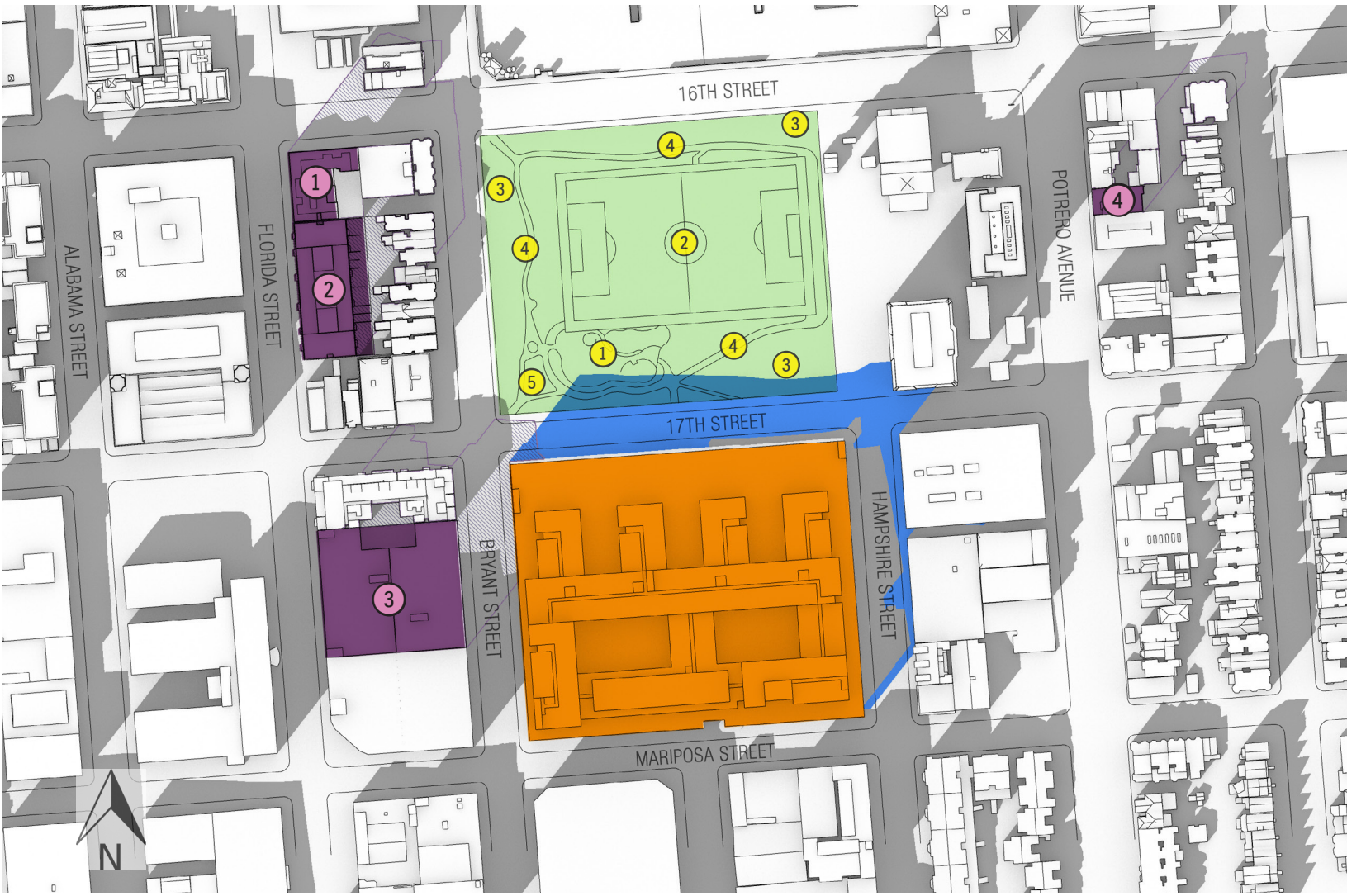
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.27 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

2:45 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.28 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

3:00 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

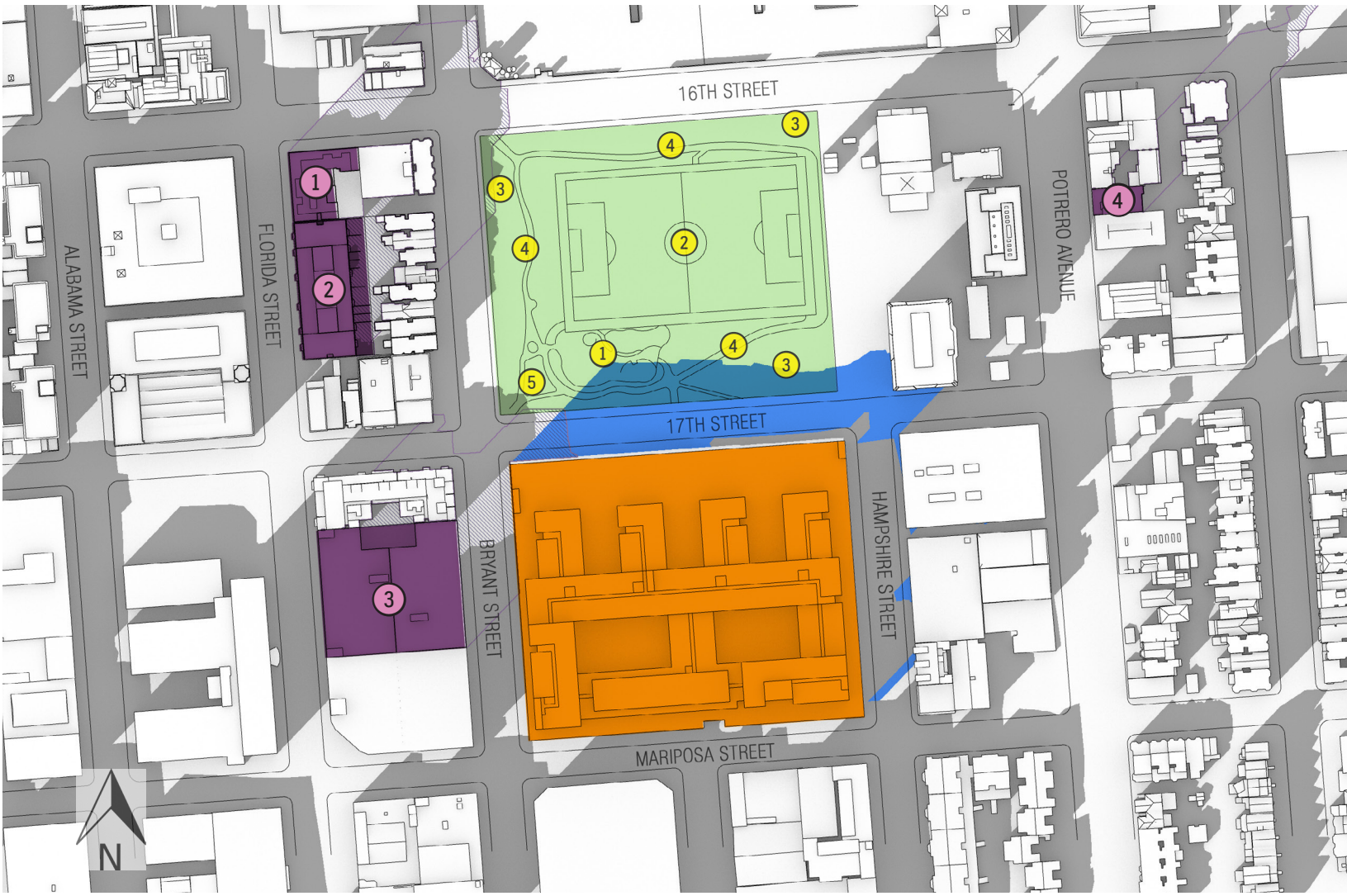
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.29 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

3:15 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

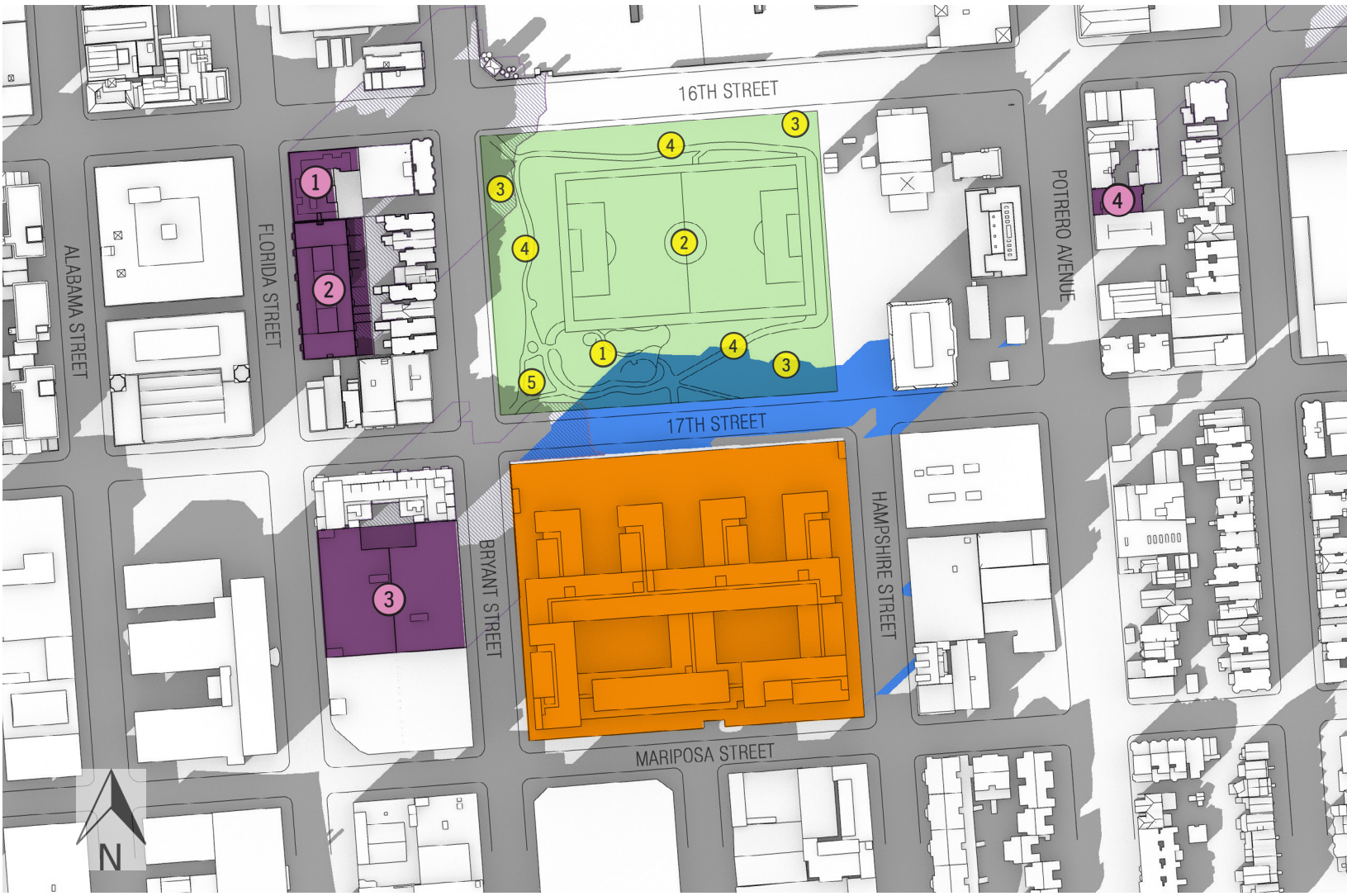
Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.30 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice



WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

3:30 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.31 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

3:45 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

PREVISION DESIGN

D1.32 SFMTA POTRERO YARD

Shadow diagrams on the Winter Solstice

WINTER SOLSTICE
DECEMBER 20 & DECEMBER 21

3:54 PM

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Franklin Square Park (RPD)
1. Children's Play Area
2. Soccer Field
3. Grass/Landscape Areas
4. Pathways
5. Adult Fitness Area

Cumulative Projects
1. 2435-2445 16th Street
2. 321 Florida Street
3. 1850 Bryant Street
4. 333-335 Potrero Avenue

EXHIBIT E: QUANTITATIVE SHADOW DATA

Quantitative Shadow Data for Franklin Square

Shadow data for existing conditions, net new shadow from project, and cumulative condition shadow

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

JUNE 21

Summer solstice
Analysis hours: 6:46 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	37,234.84	4,095.83	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	24,664.27	5,672.78	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	13,891.15	3,472.79	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	8,076.66	2,019.17	4.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	5,537.09	1,384.27	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	3,706.32	926.58	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	2,242.28	560.57	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	996.74	249.19	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	487.82	121.95	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	253.85	63.46	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	171.15	42.79	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	143.83	35.96	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	118.35	29.59	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	94.58	23.65	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	72.11	18.03	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	50.94	12.74	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	30.69	7.67	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	12.07	3.02	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.57	0.14	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	8.25	2.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	66.35	16.59	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	390.21	97.55	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	1,309.20	327.30	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	2,796.52	699.13	1.4%	0.00	0.00	0.0%	1,763.66	440.91	0.9%
7:00 PM	5,144.70	1,286.17	2.7%	0.00	0.00	0.0%	7,165.11	1,791.28	3.7%
7:15 PM	9,321.40	2,796.42	4.8%	0.00	0.00	0.0%	13,177.90	3,953.37	6.8%
7:36 PM	21,647.57	3,896.56	11.2%	0.00	0.00	0.0%	18,370.01	3,306.60	9.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

JUNE 28

Mirror date: June 14
Analysis hours: 6:48 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	37,476.08	3,747.61	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	26,566.44	5,844.62	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	15,341.15	3,835.29	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	8,533.56	2,133.39	4.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	5,863.50	1,465.87	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	3,924.96	981.24	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	2,438.02	609.51	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	1,142.31	285.58	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	530.15	132.54	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	274.88	68.72	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	175.04	43.76	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	147.35	36.84	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	121.51	30.38	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	97.40	24.35	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	74.75	18.69	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	53.34	13.33	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	33.02	8.25	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	13.87	3.47	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	1.18	0.29	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6.32	1.58	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	60.94	15.24	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	348.51	87.13	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	1,242.24	310.56	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	2,684.19	671.05	1.4%	0.00	0.00	0.0%	1,572.58	393.15	0.8%
7:00 PM	4,954.41	1,238.60	2.6%	0.00	0.00	0.0%	6,812.30	1,703.08	3.5%
7:15 PM	9,008.76	2,702.63	4.7%	0.00	0.00	0.0%	12,950.23	3,885.07	6.7%
7:36 PM	21,551.21	3,879.22	11.1%	0.00	0.00	0.0%	18,685.59	3,363.41	9.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

JULY 5

Mirror date: June 7
Analysis hours: 6:52 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	38,222.07	2,293.32	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	29,789.71	5,660.04	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	17,680.92	4,420.23	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	9,378.20	2,344.55	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	6,398.06	1,599.51	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,279.78	1,069.95	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	2,733.95	683.49	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	1,358.05	339.51	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	593.61	148.40	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	306.13	76.53	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	180.42	45.10	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	151.76	37.94	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	125.64	31.41	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	101.09	25.27	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	78.09	19.52	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	56.42	14.11	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	35.76	8.94	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	16.26	4.07	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	2.14	0.54	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6.76	1.69	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	62.57	15.64	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	365.06	91.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	1,271.60	317.90	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	2,735.99	684.00	1.4%	0.00	0.00	0.0%	1,618.65	404.66	0.8%
7:00 PM	5,024.91	1,256.23	2.6%	0.00	0.00	0.0%	7,064.94	1,766.23	3.7%
7:15 PM	9,130.35	2,739.11	4.7%	0.00	0.00	0.0%	13,420.22	4,026.07	6.9%
7:36 PM	21,271.34	3,828.84	11.0%	0.00	0.00	0.0%	19,528.88	3,515.20	10.1%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

JULY 12

Mirror date: May 31
Analysis hours: 6:56 AM-7:33 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	39,452.16	1,183.56	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	34,859.73	5,228.96	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	21,326.94	5,331.74	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	11,250.42	2,812.60	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	7,199.31	1,799.83	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,814.54	1,203.64	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,136.73	784.18	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	1,651.75	412.94	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	682.25	170.56	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	350.80	87.70	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	190.17	47.54	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	157.83	39.46	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	130.80	32.70	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	105.79	26.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	82.13	20.53	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	59.95	14.99	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	38.91	9.73	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	19.02	4.75	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3.34	0.83	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9.74	2.43	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	71.28	17.82	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	445.01	111.25	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	1,399.72	349.93	0.7%	0.00	0.00	0.0%	26.24	6.56	0.0%
6:45 PM	2,954.71	738.68	1.5%	0.00	0.00	0.0%	1,951.26	487.82	1.0%
7:00 PM	5,365.04	1,341.26	2.8%	0.00	0.00	0.0%	7,877.95	1,969.49	4.1%
7:15 PM	9,818.20	2,749.10	5.1%	0.00	0.00	0.0%	14,705.10	4,117.43	7.6%
7:33 PM	20,874.42	3,131.16	10.8%	0.00	0.00	0.0%	20,757.41	3,113.61	10.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

JULY 19

Mirror date: May 24
Analysis hours: 7:01 AM-7:30 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	40,769.99	5,300.10	21.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:16 AM	24,983.85	5,996.12	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	14,099.19	3,383.80	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	8,270.00	2,067.50	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	5,578.19	1,394.55	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,638.77	909.69	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	2,052.16	513.04	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	801.88	200.47	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	409.72	102.43	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	202.62	50.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	164.73	41.18	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	136.76	34.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	110.85	27.71	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	86.60	21.65	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	63.75	15.94	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	42.34	10.59	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	21.84	5.46	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4.95	1.24	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	16.94	4.24	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	89.72	22.43	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	629.46	157.36	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	1,689.68	422.42	0.9%	0.00	0.00	0.0%	211.11	52.78	0.1%
6:45 PM	3,377.14	844.29	1.7%	0.00	0.00	0.0%	2,753.46	688.36	1.4%
7:00 PM	6,068.70	1,517.17	3.1%	0.00	0.00	0.0%	9,450.21	2,362.55	4.9%
7:15 PM	11,131.96	2,782.99	5.8%	0.00	0.00	0.0%	16,649.49	4,162.37	8.6%
7:30 PM	20,358.31	2,646.58	10.5%	0.00	0.00	0.0%	22,426.80	2,915.48	11.6%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

JULY 26

Mirror date: May 17
Analysis hours: 7:07 AM-7:25 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	42,364.61	2,541.88	21.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	32,589.63	6,192.03	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	18,507.61	4,626.90	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	9,782.63	2,445.66	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	6,580.48	1,645.12	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	4,285.23	1,071.31	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	2,573.60	643.40	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	1,105.92	276.48	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	472.17	118.04	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	218.83	54.71	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	172.76	43.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	143.89	35.97	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	116.78	29.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	91.69	22.92	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	68.06	17.01	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	45.86	11.47	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	24.87	6.22	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	6.86	1.71	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	30.53	7.63	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	156.82	39.21	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	907.19	226.80	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	2,135.30	533.83	1.1%	0.00	0.00	0.0%	753.94	188.49	0.4%
6:45 PM	4,044.66	1,011.16	2.1%	0.00	0.00	0.0%	4,043.04	1,010.76	2.1%
7:00 PM	7,194.50	1,798.63	3.7%	0.00	0.00	0.0%	11,764.36	2,941.09	6.1%
7:15 PM	13,231.08	2,778.53	6.8%	0.00	0.00	0.0%	19,386.12	4,071.08	10.0%
7:25 PM	19,736.28	1,776.27	10.2%	0.00	0.00	0.0%	24,488.48	2,203.96	12.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

AUGUST 2

Mirror date: May 10
Analysis hours: 7:12 AM-7:18 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	43,948.77	878.98	22.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	40,679.10	6,101.86	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	24,224.58	6,056.15	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	12,488.63	3,122.16	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	7,841.46	1,960.36	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	5,083.83	1,270.96	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,172.32	793.08	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	1,475.50	368.88	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	508.26	127.06	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	235.16	58.79	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	181.63	45.41	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	151.00	37.75	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	122.95	30.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	96.70	24.18	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	72.32	18.08	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	49.24	12.31	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	27.60	6.90	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	8.55	2.14	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	3.53	0.88	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	55.14	13.79	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	377.99	94.50	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	1,302.65	325.66	0.7%	0.00	0.00	0.0%	4.45	1.11	0.0%
6:30 PM	2,806.58	701.64	1.5%	0.00	0.00	0.0%	1,507.54	376.88	0.8%
6:45 PM	5,057.51	1,264.38	2.6%	0.00	0.00	0.0%	6,352.56	1,588.14	3.3%
7:00 PM	9,070.30	2,267.58	4.7%	0.00	0.00	0.0%	14,878.09	3,719.52	7.7%
7:15 PM	16,594.54	2,489.18	8.6%	0.00	0.00	0.0%	23,836.35	3,575.45	12.3%
7:18 PM	19,046.12	571.38	9.9%	0.00	0.00	0.0%	26,571.29	797.14	13.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

AUGUST 9

Mirror date: May 3
Analysis hours: 7:19 AM-7:10 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	45,998.97	4,139.91	23.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	31,224.20	6,557.08	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	16,622.81	4,155.70	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	9,444.49	2,361.12	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	6,167.12	1,541.78	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,842.25	960.56	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	1,842.25	460.56	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	541.17	135.29	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	252.72	63.18	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	191.32	47.83	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	159.34	39.83	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	129.57	32.39	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	102.13	25.53	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	76.69	19.17	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	52.85	13.21	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	30.40	7.60	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	10.08	2.52	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	17.35	4.34	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	105.81	26.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	781.40	195.35	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	1,935.82	483.96	1.0%	0.00	0.00	0.0%	458.24	114.56	0.2%
6:30 PM	3,741.10	935.28	1.9%	0.00	0.00	0.0%	3,181.42	795.36	1.6%
6:45 PM	6,577.98	2,236.51	3.4%	0.00	0.00	0.0%	9,731.87	3,308.84	5.0%
7:10 PM	18,320.24	3,847.25	9.5%	0.00	0.00	0.0%	27,917.78	5,862.73	14.4%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

AUGUST 16

Mirror date: April 26
Analysis hours: 7:25 AM-7:02 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	47,503.52	1,900.14	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	40,112.79	6,819.17	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	22,484.65	5,621.16	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	11,740.53	2,935.13	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	7,441.29	1,860.32	3.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	4,450.15	1,112.54	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	2,320.05	580.01	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	704.92	176.23	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	272.15	68.04	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	202.37	50.59	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	168.29	42.07	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	137.08	34.27	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	108.17	27.04	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	81.53	20.38	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	56.65	14.16	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	33.24	8.31	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	11.60	2.90	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.05	0.01	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1.16	0.29	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	46.25	11.56	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	376.57	94.14	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	1,323.82	330.96	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	2,820.93	705.23	1.5%	0.00	0.00	0.0%	1,386.71	346.68	0.7%
6:30 PM	5,046.87	1,261.72	2.6%	0.00	0.00	0.0%	6,045.57	1,511.39	3.1%
6:45 PM	8,946.82	2,415.64	4.6%	0.00	0.00	0.0%	13,436.19	3,627.77	6.9%
7:02 PM	17,592.45	2,462.94	9.1%	0.00	0.00	0.0%	27,732.66	3,882.57	14.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

AUGUST 23

Mirror date: April 19
Analysis hours: 7:31 AM-6:52 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	49,081.97	5,399.02	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	29,677.38	6,825.80	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	15,110.49	3,777.62	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	8,610.85	2,152.71	4.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	5,152.74	1,288.18	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	2,841.63	710.41	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	1,009.08	252.27	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	289.70	72.42	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	214.23	53.56	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	177.80	44.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	144.54	36.13	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	114.17	28.54	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	85.89	21.47	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	59.88	14.97	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	35.57	8.89	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	12.80	3.20	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.17	0.04	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	17.70	4.43	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	133.69	33.42	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	903.39	225.85	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,156.52	539.13	1.1%	0.00	0.00	0.0%	645.73	161.43	0.3%
6:15 PM	4,050.34	1,012.58	2.1%	0.00	0.00	0.0%	3,509.57	877.39	1.8%
6:30 PM	7,011.64	1,752.91	3.6%	0.00	0.00	0.0%	10,167.28	2,541.82	5.3%
6:45 PM	12,723.41	2,417.45	6.6%	0.00	0.00	0.0%	17,865.20	3,394.39	9.2%
6:52 PM	16,945.10	1,016.71	8.8%	0.00	0.00	0.0%	25,922.14	1,555.33	13.4%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

AUGUST 30

Mirror date: April 12
Analysis hours: 7:37 AM-6:42 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	50,838.25	3,050.30	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	37,960.15	7,212.43	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	19,823.62	4,955.91	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	10,098.50	2,524.63	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	6,118.10	1,529.52	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,457.75	864.44	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	1,409.11	352.28	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	308.40	77.10	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	227.43	56.86	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	188.44	47.11	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	152.69	38.17	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	120.58	30.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	90.92	22.73	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	63.50	15.88	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	38.05	9.51	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	14.07	3.52	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.24	0.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	3.76	0.94	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	58.95	14.74	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	539.33	134.83	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	1,587.81	396.95	0.8%	0.00	0.00	0.0%	134.16	33.54	0.1%
6:00 PM	3,265.93	816.48	1.7%	0.00	0.00	0.0%	1,810.74	452.68	0.9%
6:15 PM	5,797.77	1,449.44	3.0%	0.00	0.00	0.0%	7,303.51	1,825.88	3.8%
6:30 PM	10,298.07	2,368.56	5.3%	0.00	0.00	0.0%	13,808.10	3,175.86	7.1%
6:42 PM	16,451.00	1,809.61	8.5%	0.00	0.00	0.0%	24,276.85	2,670.45	12.6%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

SEPTEMBER 6

Mirror date: April 5
Analysis hours: 7:44 AM-6:31 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	50,283.50	6,536.85	26.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	25,894.71	6,473.68	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	12,577.61	3,144.40	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	7,317.22	1,829.31	3.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	4,200.98	1,050.25	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	1,949.55	487.39	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	385.79	96.45	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	242.71	60.68	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	200.31	50.08	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	162.25	40.56	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	127.81	31.95	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	96.24	24.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	67.22	16.81	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	40.53	10.13	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	15.59	3.90	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.25	0.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	31.03	7.76	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	254.91	63.73	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	1,150.88	287.72	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,621.05	655.26	1.4%	0.00	0.00	0.0%	1,158.89	289.72	0.6%
6:00 PM	4,807.88	1,201.97	2.5%	0.00	0.00	0.0%	4,933.70	1,233.43	2.6%
6:15 PM	8,478.29	2,289.14	4.4%	0.00	0.00	0.0%	11,482.07	3,100.16	5.9%
6:31 PM	16,064.20	2,248.99	8.3%	0.00	0.00	0.0%	22,591.68	3,162.83	11.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

SEPTEMBER 13

Mirror date: March 29
Analysis hours: 7:50 AM-6:21 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	49,436.83	3,954.95	25.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	33,173.10	6,966.35	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	16,364.89	4,091.22	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	8,869.54	2,217.38	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	5,144.85	1,286.21	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	2,602.01	650.50	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	710.60	177.65	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	260.36	65.09	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	214.24	53.56	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	172.63	43.16	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	135.78	33.94	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	102.00	25.50	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	71.37	17.84	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	43.06	10.77	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	16.82	4.20	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.25	0.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	12.90	3.23	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	96.01	24.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	823.41	205.85	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,079.04	519.76	1.1%	0.00	0.00	0.0%	689.26	172.32	0.4%
5:45 PM	4,040.87	1,010.22	2.1%	0.00	0.00	0.0%	3,312.97	828.24	1.7%
6:00 PM	7,094.92	1,773.73	3.7%	0.00	0.00	0.0%	9,898.19	2,474.55	5.1%
6:15 PM	12,637.91	2,274.82	6.5%	0.00	0.00	0.0%	15,444.19	2,779.95	8.0%
6:21 PM	15,605.97	780.30	8.1%	0.00	0.00	0.0%	20,971.40	1,048.57	10.8%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

SEPTEMBER 20

Fall equinox (Spring equinox on March 22 similar)
Analysis hours: 7:57 AM-6:09 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	48,384.37	967.69	25.0%	215.02	4.30	0.1%	215.02	4.30	0.1%
8:00 AM	42,253.89	6,338.08	21.9%	82.93	12.44	0.0%	82.93	12.44	0.0%
8:15 AM	21,702.30	5,425.58	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	10,838.43	2,709.61	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	6,378.61	1,594.65	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,385.56	846.39	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	1,175.75	293.94	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	280.57	70.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	229.89	57.47	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	184.58	46.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	144.76	36.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	108.56	27.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	75.97	18.99	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	45.93	11.48	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	18.26	4.56	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.25	0.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	2.55	0.64	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	57.59	14.40	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	540.53	135.13	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,627.83	406.96	0.8%	0.00	0.00	0.0%	220.10	55.03	0.1%
5:30 PM	3,391.21	847.80	1.8%	0.00	0.00	0.0%	1,996.40	499.10	1.0%
5:45 PM	6,069.32	1,517.33	3.1%	0.00	0.00	0.0%	7,839.78	1,959.95	4.1%
6:00 PM	10,904.28	2,289.90	5.6%	0.00	0.00	0.0%	13,089.36	2,748.76	6.8%
6:09 PM	15,430.41	1,234.43	8.0%	0.00	0.00	0.0%	20,211.32	1,616.91	10.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

SEPTEMBER 27

Mirror date: March 15
Analysis hours: 8:03 AM-5:58 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	48,583.34	4,858.33	25.1%	3,324.62	332.46	1.7%	3,324.62	332.46	1.7%
8:15 AM	28,832.41	6,343.13	14.9%	2,045.12	449.93	1.1%	2,045.12	449.93	1.1%
8:30 AM	13,973.53	3,493.38	7.2%	794.98	198.75	0.4%	794.98	198.75	0.4%
8:45 AM	7,964.09	1,991.02	4.1%	244.09	61.02	0.1%	244.09	61.02	0.1%
9:00 AM	4,334.64	1,083.66	2.2%	13.58	3.40	0.0%	13.58	3.40	0.0%
9:15 AM	1,804.83	451.21	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	305.96	76.49	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	248.25	62.06	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	198.45	49.61	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	155.12	38.78	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	116.05	29.01	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	80.98	20.24	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	49.00	12.25	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	19.86	4.97	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.19	0.05	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.01	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	30.93	7.73	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	294.15	73.54	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,211.97	302.99	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	2,800.03	700.01	1.4%	0.00	0.00	0.0%	1,243.24	310.81	0.6%
5:30 PM	5,169.52	1,292.38	2.7%	0.00	0.00	0.0%	5,605.01	1,401.25	2.9%
5:45 PM	9,367.82	2,154.60	4.8%	0.00	0.00	0.0%	11,928.10	2,743.46	6.2%
5:58 PM	15,329.11	1,686.20	7.9%	0.00	0.00	0.0%	19,889.51	2,187.85	10.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

OCTOBER 4

Mirror date: March 8
Analysis hours: 8:09 AM-5:47 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	49,837.84	1,993.51	25.8%	7,728.44	309.14	4.0%	7,728.44	309.14	4.0%
8:15 AM	39,765.92	6,760.21	20.6%	6,642.20	1,129.17	3.4%	6,642.20	1,129.17	3.4%
8:30 AM	19,295.91	4,823.98	10.0%	4,440.46	1,110.11	2.3%	4,440.46	1,110.11	2.3%
8:45 AM	10,310.99	2,577.75	5.3%	2,940.46	735.11	1.5%	2,940.46	735.11	1.5%
9:00 AM	5,704.15	1,426.04	3.0%	1,512.70	378.18	0.8%	1,512.70	378.18	0.8%
9:15 AM	2,629.04	657.26	1.4%	854.52	213.63	0.4%	854.52	213.63	0.4%
9:30 AM	573.61	143.40	0.3%	394.82	98.70	0.2%	394.82	98.70	0.2%
9:45 AM	270.46	67.61	0.1%	161.60	40.40	0.1%	161.60	40.40	0.1%
10:00 AM	214.98	53.74	0.1%	24.32	6.08	0.0%	24.32	6.08	0.0%
10:15 AM	167.54	41.88	0.1%	2.33	0.58	0.0%	2.33	0.58	0.0%
10:30 AM	125.00	31.25	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	87.35	21.84	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	53.13	13.28	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	22.05	5.51	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.24	0.06	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	12.13	3.03	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	108.87	27.22	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	866.87	216.72	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	2,204.26	551.06	1.1%	0.00	0.00	0.0%	622.82	155.71	0.3%
5:15 PM	4,333.37	1,083.34	2.2%	0.00	0.00	0.0%	3,506.49	876.62	1.8%
5:30 PM	7,728.51	2,086.70	4.0%	0.00	0.00	0.0%	10,408.23	2,810.22	5.4%
5:47 PM	14,918.27	2,088.56	7.7%	0.00	0.00	0.0%	20,203.19	2,828.45	10.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

OCTOBER 11

Mirror date: March 1
Analysis hours: 8:16 AM-5:37 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	47,933.67	5,752.04	24.8%	12,908.25	1,548.99	6.7%	12,908.25	1,548.99	6.7%
8:30 AM	27,065.97	6,495.83	14.0%	9,598.95	2,303.75	5.0%	9,598.95	2,303.75	5.0%
8:45 AM	13,653.32	3,413.33	7.1%	6,993.24	1,748.31	3.6%	6,993.24	1,748.31	3.6%
9:00 AM	7,713.89	1,928.47	4.0%	5,019.55	1,254.89	2.6%	5,019.55	1,254.89	2.6%
9:15 AM	3,971.46	992.86	2.1%	3,615.59	903.90	1.9%	3,615.59	903.90	1.9%
9:30 AM	1,143.56	285.89	0.6%	2,289.86	572.47	1.2%	2,289.86	572.47	1.2%
9:45 AM	297.66	74.42	0.2%	1,507.42	376.85	0.8%	1,507.42	376.85	0.8%
10:00 AM	235.12	58.78	0.1%	964.38	241.09	0.5%	964.38	241.09	0.5%
10:15 AM	182.53	45.63	0.1%	651.28	162.82	0.3%	651.28	162.82	0.3%
10:30 AM	135.84	33.96	0.1%	363.67	90.92	0.2%	363.67	90.92	0.2%
10:45 AM	94.95	23.74	0.0%	215.03	53.76	0.1%	215.03	53.76	0.1%
11:00 AM	57.99	14.50	0.0%	70.05	17.51	0.0%	70.05	17.51	0.0%
11:15 AM	25.08	6.27	0.0%	31.79	7.95	0.0%	31.79	7.95	0.0%
11:30 AM	0.33	0.08	0.0%	5.61	1.40	0.0%	5.61	1.40	0.0%
11:45 AM	0.00	0.00	0.0%	1.12	0.28	0.0%	1.12	0.28	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.92	0.23	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	58.98	14.74	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	555.09	138.77	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,671.40	417.85	0.9%	0.00	0.00	0.0%	106.55	26.64	0.1%
5:00 PM	3,515.39	878.85	1.8%	0.00	0.00	0.0%	1,734.33	433.58	0.9%
5:15 PM	6,326.64	1,581.66	3.3%	0.00	0.00	0.0%	7,904.15	1,976.04	4.1%
5:30 PM	11,292.72	2,145.62	5.8%	39.63	7.53	0.0%	15,019.51	2,853.71	7.8%
5:37 PM	14,470.66	868.24	7.5%	486.18	29.17	0.3%	21,912.97	1,314.78	11.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

OCTOBER 18

Mirror date: February 22
Analysis hours: 8:22 AM-5:27 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	45,425.25	2,725.52	23.5%	18,481.26	1,108.88	9.6%	18,481.26	1,108.88	9.6%
8:30 AM	34,479.37	6,206.29	17.8%	16,174.80	2,911.46	8.4%	16,174.80	2,911.46	8.4%
8:45 AM	17,852.61	4,463.15	9.2%	12,295.70	3,073.93	6.4%	12,295.70	3,073.93	6.4%
9:00 AM	9,803.85	2,450.96	5.1%	9,284.90	2,321.22	4.8%	9,284.90	2,321.22	4.8%
9:15 AM	5,385.86	1,346.46	2.8%	7,167.71	1,791.93	3.7%	7,167.71	1,791.93	3.7%
9:30 AM	2,130.77	532.69	1.1%	5,461.50	1,365.37	2.8%	5,461.50	1,365.37	2.8%
9:45 AM	438.60	109.65	0.2%	4,307.09	1,076.77	2.2%	4,307.09	1,076.77	2.2%
10:00 AM	259.16	64.79	0.1%	3,134.24	783.56	1.6%	3,134.24	783.56	1.6%
10:15 AM	200.39	50.10	0.1%	2,286.52	571.63	1.2%	2,286.52	571.63	1.2%
10:30 AM	148.75	37.19	0.1%	1,551.29	387.82	0.8%	1,551.29	387.82	0.8%
10:45 AM	104.17	26.04	0.1%	1,218.95	304.74	0.6%	1,218.95	304.74	0.6%
11:00 AM	64.20	16.05	0.0%	886.63	221.66	0.5%	886.63	221.66	0.5%
11:15 AM	28.92	7.23	0.0%	713.81	178.45	0.4%	713.81	178.45	0.4%
11:30 AM	0.69	0.17	0.0%	505.33	126.33	0.3%	505.33	126.33	0.3%
11:45 AM	0.00	0.00	0.0%	409.42	102.35	0.2%	409.42	102.35	0.2%
12:00 PM	0.00	0.00	0.0%	272.01	68.00	0.1%	272.01	68.00	0.1%
12:15 PM	0.00	0.00	0.0%	220.56	55.14	0.1%	220.56	55.14	0.1%
12:30 PM	0.00	0.00	0.0%	117.19	29.30	0.1%	117.19	29.30	0.1%
12:45 PM	0.00	0.00	0.0%	74.08	18.52	0.0%	74.08	18.52	0.0%
1:00 PM	0.00	0.00	0.0%	20.85	5.21	0.0%	20.85	5.21	0.0%
1:15 PM	0.00	0.00	0.0%	11.45	2.86	0.0%	11.45	2.86	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	5.50	1.37	0.0%	5.50	1.37	0.0%
3:30 PM	0.00	0.00	0.0%	8.39	2.10	0.0%	8.39	2.10	0.0%
3:45 PM	0.00	0.00	0.0%	26.54	6.63	0.0%	26.54	6.63	0.0%
4:00 PM	25.72	6.43	0.0%	37.06	9.26	0.0%	37.06	9.26	0.0%
4:15 PM	263.02	65.75	0.1%	80.44	20.11	0.0%	80.44	20.11	0.0%
4:30 PM	1,136.96	284.24	0.6%	131.08	32.77	0.1%	131.08	32.77	0.1%
4:45 PM	2,728.86	682.21	1.4%	506.90	126.72	0.3%	1,290.78	322.70	0.7%
5:00 PM	5,101.85	1,275.46	2.6%	1,420.41	355.10	0.7%	6,570.48	1,642.62	3.4%
5:15 PM	8,660.30	1,905.27	4.5%	2,425.51	533.61	1.3%	13,830.86	3,042.79	7.2%
5:27 PM	14,347.32	1,434.73	7.4%	3,278.29	327.83	1.7%	23,663.70	2,366.37	12.2%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

OCTOBER 25

Mirror date: February 15
Analysis hours: 7:30 AM-4:18 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	42,249.19	5,492.40	21.9%	24,661.64	3,206.01	12.8%	24,661.64	3,206.01	12.8%
7:45 AM	23,674.29	5,918.57	12.2%	18,777.42	4,694.35	9.7%	18,777.42	4,694.35	9.7%
8:00 AM	12,736.56	3,184.14	6.6%	14,408.16	3,602.04	7.5%	14,408.16	3,602.04	7.5%
8:15 AM	7,079.41	1,769.85	3.7%	11,505.43	2,876.36	6.0%	11,505.43	2,876.36	6.0%
8:30 AM	3,194.49	798.62	1.7%	9,100.85	2,275.21	4.7%	9,100.85	2,275.21	4.7%
8:45 AM	776.52	194.13	0.4%	7,427.01	1,856.75	3.8%	7,427.01	1,856.75	3.8%
9:00 AM	338.36	84.59	0.2%	5,963.07	1,490.77	3.1%	5,963.07	1,490.77	3.1%
9:15 AM	226.25	56.56	0.1%	5,005.78	1,251.44	2.6%	5,005.78	1,251.44	2.6%
9:30 AM	164.74	41.18	0.1%	3,981.69	995.42	2.1%	3,981.69	995.42	2.1%
9:45 AM	115.69	28.92	0.1%	3,275.51	818.88	1.7%	3,275.51	818.88	1.7%
10:00 AM	72.15	18.04	0.0%	2,449.82	612.46	1.3%	2,449.82	612.46	1.3%
10:15 AM	34.19	8.55	0.0%	1,991.62	497.91	1.0%	1,991.62	497.91	1.0%
10:30 AM	1.98	0.49	0.0%	1,537.76	384.44	0.8%	1,537.76	384.44	0.8%
10:45 AM	0.00	0.00	0.0%	1,350.35	337.59	0.7%	1,350.35	337.59	0.7%
11:00 AM	0.00	0.00	0.0%	1,107.68	276.92	0.6%	1,107.68	276.92	0.6%
11:15 AM	0.00	0.00	0.0%	1,013.04	253.26	0.5%	1,013.04	253.26	0.5%
11:30 AM	0.00	0.00	0.0%	813.62	203.40	0.4%	813.62	203.40	0.4%
11:45 AM	0.00	0.00	0.0%	688.22	172.05	0.4%	688.22	172.05	0.4%
12:00 PM	0.00	0.00	0.0%	536.14	134.04	0.3%	536.14	134.04	0.3%
12:15 PM	0.00	0.00	0.0%	496.70	124.18	0.3%	496.70	124.18	0.3%
12:30 PM	0.00	0.00	0.0%	408.98	102.24	0.2%	408.98	102.24	0.2%
12:45 PM	0.00	0.00	0.0%	402.48	100.62	0.2%	402.48	100.62	0.2%
1:00 PM	0.00	0.00	0.0%	348.48	87.12	0.2%	348.48	87.12	0.2%
1:15 PM	0.00	0.00	0.0%	365.26	91.31	0.2%	365.26	91.31	0.2%
1:30 PM	0.00	0.00	0.0%	337.28	84.32	0.2%	337.28	84.32	0.2%
1:45 PM	0.00	0.00	0.0%	379.26	94.81	0.2%	379.26	94.81	0.2%
2:00 PM	0.00	0.00	0.0%	378.69	94.67	0.2%	378.69	94.67	0.2%
2:15 PM	0.00	0.00	0.0%	456.26	114.07	0.2%	456.26	114.07	0.2%
2:30 PM	0.00	0.00	0.0%	506.24	126.56	0.3%	506.24	126.56	0.3%
2:45 PM	3.95	0.99	0.0%	769.89	192.47	0.4%	769.89	192.47	0.4%
3:00 PM	85.21	21.30	0.0%	1,207.00	301.75	0.6%	1,207.00	301.75	0.6%
3:15 PM	692.85	173.21	0.4%	1,993.05	498.26	1.0%	1,993.05	498.26	1.0%
3:30 PM	1,906.69	476.67	1.0%	2,706.90	676.72	1.4%	2,936.63	734.16	1.5%
3:45 PM	3,958.82	989.70	2.0%	3,709.38	927.35	1.9%	6,027.28	1,506.82	3.1%
4:00 PM	7,246.29	1,811.57	3.7%	4,807.72	1,201.93	2.5%	13,448.41	3,362.10	7.0%
4:15 PM	13,601.33	2,040.20	7.0%	5,958.91	893.84	3.1%	22,062.73	3,309.41	11.4%
4:18 PM	15,283.45	458.50	7.9%	6,131.05	183.93	3.2%	24,640.03	739.20	12.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

NOVEMBER 1

Mirror date: February 8
Analysis hours: 7:36 AM-4:10 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	41,190.68	2,883.35	21.3%	30,979.13	2,168.54	16.0%	30,979.13	2,168.54	16.0%
7:45 AM	29,654.17	5,634.29	15.3%	27,387.07	5,203.54	14.2%	27,387.07	5,203.54	14.2%
8:00 AM	17,144.31	4,286.08	8.9%	20,774.40	5,193.60	10.7%	20,774.40	5,193.60	10.7%
8:15 AM	9,236.54	2,309.14	4.8%	16,544.55	4,136.14	8.6%	16,544.55	4,136.14	8.6%
8:30 AM	4,490.95	1,122.74	2.3%	13,204.89	3,301.22	6.8%	13,204.89	3,301.22	6.8%
8:45 AM	1,464.24	366.06	0.8%	11,039.19	2,759.80	5.7%	11,039.19	2,759.80	5.7%
9:00 AM	390.02	97.51	0.2%	9,134.71	2,283.68	4.7%	9,134.71	2,283.68	4.7%
9:15 AM	261.67	65.42	0.1%	7,792.89	1,948.22	4.0%	7,792.89	1,948.22	4.0%
9:30 AM	184.21	46.05	0.1%	6,500.80	1,625.20	3.4%	6,500.80	1,625.20	3.4%
9:45 AM	129.91	32.48	0.1%	5,718.48	1,429.62	3.0%	5,718.48	1,429.62	3.0%
10:00 AM	82.10	20.53	0.0%	4,855.48	1,213.87	2.5%	4,855.48	1,213.87	2.5%
10:15 AM	41.04	10.26	0.0%	4,303.07	1,075.77	2.2%	4,303.07	1,075.77	2.2%
10:30 AM	4.87	1.22	0.0%	3,619.66	904.91	1.9%	3,619.66	904.91	1.9%
10:45 AM	0.00	0.00	0.0%	3,229.75	807.44	1.7%	3,229.75	807.44	1.7%
11:00 AM	0.00	0.00	0.0%	2,679.04	669.76	1.4%	2,679.04	669.76	1.4%
11:15 AM	0.00	0.00	0.0%	2,435.91	608.98	1.3%	2,435.91	608.98	1.3%
11:30 AM	0.00	0.00	0.0%	1,983.61	495.90	1.0%	1,983.61	495.90	1.0%
11:45 AM	0.00	0.00	0.0%	1,752.97	438.24	0.9%	1,752.97	438.24	0.9%
12:00 PM	0.00	0.00	0.0%	1,450.93	362.73	0.8%	1,450.93	362.73	0.8%
12:15 PM	0.00	0.00	0.0%	1,392.49	348.12	0.7%	1,392.49	348.12	0.7%
12:30 PM	0.00	0.00	0.0%	1,229.73	307.43	0.6%	1,229.73	307.43	0.6%
12:45 PM	0.00	0.00	0.0%	1,250.14	312.53	0.6%	1,250.14	312.53	0.6%
1:00 PM	0.00	0.00	0.0%	1,166.11	291.53	0.6%	1,166.11	291.53	0.6%
1:15 PM	0.00	0.00	0.0%	1,286.47	321.62	0.7%	1,286.47	321.62	0.7%
1:30 PM	0.00	0.00	0.0%	1,302.78	325.70	0.7%	1,302.78	325.70	0.7%
1:45 PM	0.00	0.00	0.0%	1,602.52	400.63	0.8%	1,602.52	400.63	0.8%
2:00 PM	0.00	0.00	0.0%	1,793.71	448.43	0.9%	1,793.71	448.43	0.9%
2:15 PM	0.00	0.00	0.0%	2,275.91	568.98	1.2%	2,275.91	568.98	1.2%
2:30 PM	0.00	0.00	0.0%	2,630.87	657.72	1.4%	2,630.87	657.72	1.4%
2:45 PM	32.18	8.04	0.0%	3,269.80	817.45	1.7%	3,269.80	817.45	1.7%
3:00 PM	279.09	69.77	0.1%	3,820.52	955.13	2.0%	3,820.52	955.13	2.0%
3:15 PM	1,209.90	302.47	0.6%	4,709.65	1,177.41	2.4%	4,709.66	1,177.41	2.4%
3:30 PM	2,959.24	739.81	1.5%	5,681.74	1,420.44	2.9%	6,492.75	1,623.19	3.4%
3:45 PM	5,919.68	1,479.92	3.1%	6,991.95	1,747.99	3.6%	12,045.78	3,011.44	6.2%
4:00 PM	10,882.62	2,285.35	5.6%	8,266.93	1,736.06	4.3%	19,348.18	4,063.12	10.0%
4:10 PM	16,121.72	1,450.95	8.3%	9,534.48	858.10	4.9%	25,903.86	2,331.35	13.4%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

NOVEMBER 8

Mirror date: February 1
Analysis hours: 7:43 AM-4:03 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	39,567.78	395.68	20.5%	36,533.38	365.33	18.9%	36,533.38	365.33	18.9%
7:45 AM	37,836.99	4,918.81	19.6%	36,239.98	4,711.20	18.7%	36,239.98	4,711.20	18.7%
8:00 AM	21,633.35	5,408.34	11.2%	29,010.43	7,252.61	15.0%	29,010.43	7,252.61	15.0%
8:15 AM	12,472.71	3,118.18	6.5%	22,887.01	5,721.75	11.8%	22,887.01	5,721.75	11.8%
8:30 AM	6,746.08	1,686.52	3.5%	18,029.96	4,507.49	9.3%	18,029.96	4,507.49	9.3%
8:45 AM	2,473.38	618.35	1.3%	14,931.88	3,732.97	7.7%	14,931.88	3,732.97	7.7%
9:00 AM	417.76	104.44	0.2%	12,500.15	3,125.04	6.5%	12,500.15	3,125.04	6.5%
9:15 AM	294.30	73.58	0.2%	10,877.15	2,719.29	5.6%	10,877.15	2,719.29	5.6%
9:30 AM	207.77	51.94	0.1%	9,314.95	2,328.74	4.8%	9,314.95	2,328.74	4.8%
9:45 AM	147.31	36.83	0.1%	8,252.37	2,063.09	4.3%	8,252.37	2,063.09	4.3%
10:00 AM	94.81	23.70	0.0%	7,135.42	1,783.85	3.7%	7,135.42	1,783.85	3.7%
10:15 AM	49.97	12.49	0.0%	6,484.53	1,621.13	3.4%	6,484.53	1,621.13	3.4%
10:30 AM	10.63	2.66	0.0%	5,763.86	1,440.96	3.0%	5,763.86	1,440.96	3.0%
10:45 AM	0.00	0.00	0.0%	5,359.27	1,339.82	2.8%	5,359.27	1,339.82	2.8%
11:00 AM	0.00	0.00	0.0%	4,810.83	1,202.71	2.5%	4,810.83	1,202.71	2.5%
11:15 AM	0.00	0.00	0.0%	4,565.70	1,141.43	2.4%	4,565.70	1,141.43	2.4%
11:30 AM	0.00	0.00	0.0%	4,067.09	1,016.77	2.1%	4,067.09	1,016.77	2.1%
11:45 AM	0.00	0.00	0.0%	3,771.90	942.97	2.0%	3,771.90	942.97	2.0%
12:00 PM	0.00	0.00	0.0%	3,379.66	844.91	1.7%	3,379.66	844.91	1.7%
12:15 PM	0.00	0.00	0.0%	3,309.31	827.33	1.7%	3,309.31	827.33	1.7%
12:30 PM	0.00	0.00	0.0%	3,085.75	771.44	1.6%	3,085.75	771.44	1.6%
12:45 PM	0.00	0.00	0.0%	3,155.51	788.88	1.6%	3,155.51	788.88	1.6%
1:00 PM	0.00	0.00	0.0%	3,074.69	768.67	1.6%	3,074.69	768.67	1.6%
1:15 PM	0.00	0.00	0.0%	3,277.06	819.27	1.7%	3,277.06	819.27	1.7%
1:30 PM	0.00	0.00	0.0%	3,339.32	834.83	1.7%	3,339.32	834.83	1.7%
1:45 PM	0.00	0.00	0.0%	3,687.64	921.91	1.9%	3,687.64	921.91	1.9%
2:00 PM	0.00	0.00	0.0%	3,910.53	977.63	2.0%	3,910.53	977.63	2.0%
2:15 PM	0.00	0.00	0.0%	4,410.13	1,102.53	2.3%	4,410.13	1,102.53	2.3%
2:30 PM	0.69	0.17	0.0%	4,818.46	1,204.61	2.5%	4,818.46	1,204.61	2.5%
2:45 PM	111.41	27.85	0.1%	5,617.40	1,404.35	2.9%	5,617.40	1,404.35	2.9%
3:00 PM	704.19	176.05	0.4%	6,394.76	1,598.69	3.3%	6,394.76	1,598.69	3.3%
3:15 PM	2,016.81	504.20	1.0%	7,552.76	1,888.19	3.9%	7,727.88	1,931.97	4.0%
3:30 PM	4,370.89	1,092.72	2.3%	8,667.11	2,166.78	4.5%	10,571.12	2,642.78	5.5%
3:45 PM	8,186.03	2,046.51	4.2%	10,413.04	2,603.26	5.4%	17,480.30	4,370.08	9.0%
4:00 PM	14,825.30	2,223.80	7.7%	12,839.62	1,925.94	6.6%	25,288.91	3,793.34	13.1%
4:03 PM	16,836.89	505.11	8.7%	13,424.99	402.75	6.9%	27,646.37	829.39	14.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

NOVEMBER 15

Mirror date: January 25
Analysis hours: 7:51 AM-3:57 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	38,616.77	3,089.34	20.0%	41,739.62	3,339.17	21.6%	41,739.62	3,339.17	21.6%
8:00 AM	27,300.65	5,460.13	14.1%	36,911.37	7,382.27	19.1%	36,911.37	7,382.27	19.1%
8:15 AM	16,456.39	4,114.10	8.5%	30,614.37	7,653.59	15.8%	30,614.37	7,653.59	15.8%
8:30 AM	9,123.04	2,280.76	4.7%	23,880.84	5,970.21	12.4%	23,880.84	5,970.21	12.4%
8:45 AM	4,471.87	1,117.97	2.3%	19,446.98	4,861.75	10.1%	19,446.98	4,861.75	10.1%
9:00 AM	1,100.53	275.13	0.6%	16,087.40	4,021.85	8.3%	16,087.40	4,021.85	8.3%
9:15 AM	327.36	81.84	0.2%	13,973.39	3,493.35	7.2%	13,973.39	3,493.35	7.2%
9:30 AM	235.84	58.96	0.1%	12,124.87	3,031.22	6.3%	12,124.87	3,031.22	6.3%
9:45 AM	168.33	42.08	0.1%	10,883.01	2,720.75	5.6%	10,883.01	2,720.75	5.6%
10:00 AM	110.05	27.51	0.1%	9,606.49	2,401.62	5.0%	9,606.49	2,401.62	5.0%
10:15 AM	60.98	15.25	0.0%	8,789.27	2,197.32	4.5%	8,789.27	2,197.32	4.5%
10:30 AM	18.33	4.58	0.0%	7,861.37	1,965.34	4.1%	7,861.37	1,965.34	4.1%
10:45 AM	0.00	0.00	0.0%	7,342.84	1,835.71	3.8%	7,342.84	1,835.71	3.8%
11:00 AM	0.00	0.00	0.0%	6,719.81	1,679.95	3.5%	6,719.81	1,679.95	3.5%
11:15 AM	0.00	0.00	0.0%	6,458.10	1,614.53	3.3%	6,458.10	1,614.53	3.3%
11:30 AM	0.00	0.00	0.0%	5,948.89	1,487.22	3.1%	5,948.89	1,487.22	3.1%
11:45 AM	0.00	0.00	0.0%	5,598.55	1,399.64	2.9%	5,598.55	1,399.64	2.9%
12:00 PM	0.00	0.00	0.0%	5,179.98	1,294.99	2.7%	5,179.98	1,294.99	2.7%
12:15 PM	0.00	0.00	0.0%	5,088.70	1,272.18	2.6%	5,088.70	1,272.18	2.6%
12:30 PM	0.00	0.00	0.0%	4,855.85	1,213.96	2.5%	4,855.85	1,213.96	2.5%
12:45 PM	0.00	0.00	0.0%	4,915.34	1,228.84	2.5%	4,915.34	1,228.84	2.5%
1:00 PM	0.00	0.00	0.0%	4,836.28	1,209.07	2.5%	4,836.28	1,209.07	2.5%
1:15 PM	0.00	0.00	0.0%	5,042.10	1,260.53	2.6%	5,042.10	1,260.53	2.6%
1:30 PM	0.00	0.00	0.0%	5,120.36	1,280.09	2.6%	5,120.36	1,280.09	2.6%
1:45 PM	0.00	0.00	0.0%	5,498.22	1,374.55	2.8%	5,498.22	1,374.55	2.8%
2:00 PM	0.00	0.00	0.0%	5,793.52	1,448.38	3.0%	5,793.52	1,448.38	3.0%
2:15 PM	0.00	0.00	0.0%	6,454.26	1,613.56	3.3%	6,454.26	1,613.56	3.3%
2:30 PM	19.45	4.86	0.0%	7,025.89	1,756.47	3.6%	7,025.89	1,756.47	3.6%
2:45 PM	268.18	67.05	0.1%	7,976.26	1,994.06	4.1%	7,976.26	1,994.06	4.1%
3:00 PM	1,106.12	276.53	0.6%	8,876.86	2,219.22	4.6%	8,876.86	2,219.22	4.6%
3:15 PM	2,879.43	719.86	1.5%	10,189.53	2,547.38	5.3%	10,740.34	2,685.08	5.6%
3:30 PM	5,712.94	1,428.24	3.0%	11,788.82	2,947.21	6.1%	14,896.05	3,724.01	7.7%
3:45 PM	10,549.93	2,426.48	5.5%	14,739.92	3,390.18	7.6%	22,516.24	5,178.73	11.6%
3:57 PM	18,195.53	2,001.51	9.4%	17,179.11	1,889.70	8.9%	28,717.26	3,158.90	14.9%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

NOVEMBER 22

Mirror date: January 18
Analysis hours: 7:57 AM-3:54 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	37,280.91	745.62	19.3%	46,333.65	926.67	24.0%	46,333.65	926.67	24.0%
8:00 AM	34,611.64	5,191.75	17.9%	45,626.84	6,844.03	23.6%	45,626.84	6,844.03	23.6%
8:15 AM	20,996.70	5,249.17	10.9%	37,713.79	9,428.45	19.5%	37,713.79	9,428.45	19.5%
8:30 AM	11,772.46	2,943.12	6.1%	30,684.08	7,671.02	15.9%	30,684.08	7,671.02	15.9%
8:45 AM	6,293.31	1,573.33	3.3%	24,942.17	6,235.54	12.9%	24,942.17	6,235.54	12.9%
9:00 AM	2,583.93	645.98	1.3%	20,052.43	5,013.11	10.4%	20,052.43	5,013.11	10.4%
9:15 AM	907.31	226.83	0.5%	17,240.08	4,310.02	8.9%	17,240.08	4,310.02	8.9%
9:30 AM	288.34	72.08	0.1%	14,865.68	3,716.42	7.7%	14,865.68	3,716.42	7.7%
9:45 AM	193.08	48.27	0.1%	13,383.20	3,345.80	6.9%	13,383.20	3,345.80	6.9%
10:00 AM	128.36	32.09	0.1%	11,933.98	2,983.50	6.2%	11,933.98	2,983.50	6.2%
10:15 AM	74.53	18.63	0.0%	10,999.51	2,749.88	5.7%	10,999.51	2,749.88	5.7%
10:30 AM	28.05	7.01	0.0%	9,971.39	2,492.85	5.2%	9,971.39	2,492.85	5.2%
10:45 AM	0.00	0.00	0.0%	9,378.20	2,344.55	4.9%	9,378.20	2,344.55	4.9%
11:00 AM	0.00	0.00	0.0%	8,643.44	2,160.86	4.5%	8,643.44	2,160.86	4.5%
11:15 AM	0.00	0.00	0.0%	8,306.77	2,076.69	4.3%	8,306.77	2,076.69	4.3%
11:30 AM	0.00	0.00	0.0%	7,717.49	1,929.37	4.0%	7,717.49	1,929.37	4.0%
11:45 AM	0.00	0.00	0.0%	7,271.47	1,817.87	3.8%	7,271.47	1,817.87	3.8%
12:00 PM	0.00	0.00	0.0%	6,775.27	1,693.82	3.5%	6,775.27	1,693.82	3.5%
12:15 PM	0.00	0.00	0.0%	6,661.89	1,665.47	3.4%	6,661.89	1,665.47	3.4%
12:30 PM	0.00	0.00	0.0%	6,399.11	1,599.78	3.3%	6,399.11	1,599.78	3.3%
12:45 PM	0.00	0.00	0.0%	6,470.50	1,617.62	3.3%	6,470.50	1,617.62	3.3%
1:00 PM	0.00	0.00	0.0%	6,395.42	1,598.86	3.3%	6,395.42	1,598.86	3.3%
1:15 PM	0.00	0.00	0.0%	6,666.65	1,666.66	3.4%	6,666.65	1,666.66	3.4%
1:30 PM	0.00	0.00	0.0%	6,797.52	1,699.38	3.5%	6,797.52	1,699.38	3.5%
1:45 PM	0.00	0.00	0.0%	7,281.65	1,820.41	3.8%	7,281.65	1,820.41	3.8%
2:00 PM	0.00	0.00	0.0%	7,633.51	1,908.38	3.9%	7,633.51	1,908.38	3.9%
2:15 PM	0.00	0.00	0.0%	8,354.79	2,088.70	4.3%	8,354.79	2,088.70	4.3%
2:30 PM	68.50	17.13	0.0%	8,997.32	2,249.33	4.7%	8,997.32	2,249.33	4.7%
2:45 PM	434.98	108.74	0.2%	10,046.46	2,511.61	5.2%	10,046.46	2,511.61	5.2%
3:00 PM	1,474.24	368.56	0.8%	11,080.72	2,770.18	5.7%	11,080.72	2,770.18	5.7%
3:15 PM	3,625.43	906.36	1.9%	12,855.94	3,213.98	6.6%	13,695.97	3,423.99	7.1%
3:30 PM	6,827.43	1,706.86	3.5%	15,415.19	3,853.80	8.0%	19,232.32	4,808.08	9.9%
3:45 PM	13,144.76	2,628.95	6.8%	18,802.14	3,760.43	9.7%	26,188.65	5,237.73	13.5%
3:54 PM	19,314.82	1,545.19	10.0%	20,817.42	1,665.39	10.8%	30,510.61	2,440.85	15.8%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

NOVEMBER 29

Mirror date: January 11
Analysis hours: 8:04 AM-3:51 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	36,983.21	3,328.49	19.1%	50,236.19	4,521.26	26.0%	50,236.19	4,521.26	26.0%
8:15 AM	26,057.00	5,471.97	13.5%	43,674.28	9,171.60	22.6%	43,674.28	9,171.60	22.6%
8:30 AM	15,141.82	3,785.46	7.8%	37,421.70	9,355.42	19.4%	37,421.70	9,355.42	19.4%
8:45 AM	8,406.49	2,101.62	4.3%	30,538.19	7,634.55	15.8%	30,538.19	7,634.55	15.8%
9:00 AM	3,777.01	944.25	2.0%	24,782.17	6,195.54	12.8%	24,782.17	6,195.54	12.8%
9:15 AM	1,282.04	320.51	0.7%	20,563.64	5,140.91	10.6%	20,563.64	5,140.91	10.6%
9:30 AM	886.31	221.58	0.5%	17,621.67	4,405.42	9.1%	17,621.67	4,405.42	9.1%
9:45 AM	397.84	99.46	0.2%	15,736.57	3,934.14	8.1%	15,736.57	3,934.14	8.1%
10:00 AM	148.95	37.24	0.1%	14,030.11	3,507.53	7.3%	14,030.11	3,507.53	7.3%
10:15 AM	90.28	22.57	0.0%	12,964.04	3,241.01	6.7%	12,964.04	3,241.01	6.7%
10:30 AM	39.71	9.93	0.0%	11,827.56	2,956.89	6.1%	11,827.56	2,956.89	6.1%
10:45 AM	1.66	0.42	0.0%	11,159.48	2,789.87	5.8%	11,159.48	2,789.87	5.8%
11:00 AM	0.00	0.00	0.0%	10,360.88	2,590.22	5.4%	10,360.88	2,590.22	5.4%
11:15 AM	0.00	0.00	0.0%	9,982.47	2,495.62	5.2%	9,982.47	2,495.62	5.2%
11:30 AM	0.00	0.00	0.0%	9,407.32	2,351.83	4.9%	9,407.32	2,351.83	4.9%
11:45 AM	0.00	0.00	0.0%	8,888.96	2,222.24	4.6%	8,888.96	2,222.24	4.6%
12:00 PM	0.00	0.00	0.0%	8,348.68	2,087.17	4.3%	8,348.68	2,087.17	4.3%
12:15 PM	0.00	0.00	0.0%	8,192.14	2,048.04	4.2%	8,192.14	2,048.04	4.2%
12:30 PM	0.00	0.00	0.0%	7,859.29	1,964.82	4.1%	7,859.29	1,964.82	4.1%
12:45 PM	0.00	0.00	0.0%	7,931.80	1,982.95	4.1%	7,931.80	1,982.95	4.1%
1:00 PM	0.00	0.00	0.0%	7,849.74	1,962.44	4.1%	7,849.74	1,962.44	4.1%
1:15 PM	0.00	0.00	0.0%	8,130.85	2,032.71	4.2%	8,130.85	2,032.71	4.2%
1:30 PM	0.00	0.00	0.0%	8,269.18	2,067.30	4.3%	8,269.18	2,067.30	4.3%
1:45 PM	0.00	0.00	0.0%	8,772.33	2,193.08	4.5%	8,772.33	2,193.08	4.5%
2:00 PM	0.00	0.00	0.0%	9,143.18	2,285.79	4.7%	9,143.18	2,285.79	4.7%
2:15 PM	0.00	0.00	0.0%	9,912.18	2,478.05	5.1%	9,912.18	2,478.05	5.1%
2:30 PM	108.02	27.01	0.1%	10,602.55	2,650.64	5.5%	10,602.55	2,650.64	5.5%
2:45 PM	568.64	142.16	0.3%	11,775.24	2,943.81	6.1%	11,775.24	2,943.81	6.1%
3:00 PM	1,716.74	429.19	0.9%	13,087.56	3,271.89	6.8%	13,097.81	3,274.45	6.8%
3:15 PM	4,116.07	1,029.02	2.1%	15,488.04	3,872.01	8.0%	16,478.03	4,119.51	8.5%
3:30 PM	7,697.84	1,924.46	4.0%	18,508.63	4,627.16	9.6%	22,484.48	5,621.12	11.6%
3:45 PM	15,313.78	2,756.48	7.9%	22,591.34	4,066.44	11.7%	29,438.03	5,298.85	15.2%
3:51 PM	20,592.10	1,029.61	10.7%	24,293.19	1,214.66	12.6%	32,036.89	1,601.84	16.6%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

DECEMBER 6

Mirror date: January 4
Analysis hours: 8:10 AM-3:51 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	37,129.43	1,485.18	19.2%	53,320.76	2,132.83	27.6%	53,320.76	2,132.83	27.6%
8:15 AM	31,675.71	5,384.87	16.4%	49,935.86	8,489.10	25.8%	49,935.86	8,489.10	25.8%
8:30 AM	19,045.35	4,761.34	9.9%	42,223.14	10,555.79	21.8%	42,223.14	10,555.79	21.8%
8:45 AM	10,615.55	2,653.89	5.5%	35,553.32	8,888.33	18.4%	35,553.32	8,888.33	18.4%
9:00 AM	5,193.42	1,298.35	2.7%	29,200.19	7,300.05	15.1%	29,200.19	7,300.05	15.1%
9:15 AM	2,015.37	503.84	1.0%	24,351.20	6,087.80	12.6%	24,351.20	6,087.80	12.6%
9:30 AM	1,067.18	266.80	0.6%	20,168.80	5,042.20	10.4%	20,168.80	5,042.20	10.4%
9:45 AM	796.95	199.24	0.4%	17,901.06	4,475.26	9.3%	17,901.06	4,475.26	9.3%
10:00 AM	341.37	85.34	0.2%	15,857.31	3,964.33	8.2%	15,857.31	3,964.33	8.2%
10:15 AM	109.02	27.25	0.1%	14,602.94	3,650.74	7.6%	14,602.94	3,650.74	7.6%
10:30 AM	52.87	13.22	0.0%	13,340.21	3,335.05	6.9%	13,340.21	3,335.05	6.9%
10:45 AM	7.93	1.98	0.0%	12,596.99	3,149.25	6.5%	12,596.99	3,149.25	6.5%
11:00 AM	0.00	0.00	0.0%	11,733.30	2,933.32	6.1%	11,733.30	2,933.32	6.1%
11:15 AM	0.00	0.00	0.0%	11,310.75	2,827.69	5.9%	11,310.75	2,827.69	5.9%
11:30 AM	0.00	0.00	0.0%	10,737.48	2,684.37	5.6%	10,737.48	2,684.37	5.6%
11:45 AM	0.00	0.00	0.0%	10,140.70	2,535.18	5.2%	10,140.70	2,535.18	5.2%
12:00 PM	0.00	0.00	0.0%	9,495.84	2,373.96	4.9%	9,495.84	2,373.96	4.9%
12:15 PM	0.00	0.00	0.0%	9,321.76	2,330.44	4.8%	9,321.76	2,330.44	4.8%
12:30 PM	0.00	0.00	0.0%	9,003.48	2,250.87	4.7%	9,003.48	2,250.87	4.7%
12:45 PM	0.00	0.00	0.0%	9,059.68	2,264.92	4.7%	9,059.68	2,264.92	4.7%
1:00 PM	0.00	0.00	0.0%	8,959.63	2,239.91	4.6%	8,959.63	2,239.91	4.6%
1:15 PM	0.00	0.00	0.0%	9,235.94	2,308.99	4.8%	9,235.94	2,308.99	4.8%
1:30 PM	0.00	0.00	0.0%	9,370.40	2,342.60	4.8%	9,370.40	2,342.60	4.8%
1:45 PM	0.00	0.00	0.0%	9,878.47	2,469.62	5.1%	9,878.47	2,469.62	5.1%
2:00 PM	0.00	0.00	0.0%	10,253.68	2,563.42	5.3%	10,253.68	2,563.42	5.3%
2:15 PM	0.00	0.00	0.0%	11,044.39	2,761.10	5.7%	11,044.39	2,761.10	5.7%
2:30 PM	116.37	29.09	0.1%	11,781.72	2,945.43	6.1%	11,781.72	2,945.43	6.1%
2:45 PM	608.71	152.18	0.3%	13,127.00	3,281.75	6.8%	13,127.00	3,281.75	6.8%
3:00 PM	1,797.63	449.41	0.9%	14,634.17	3,658.54	7.6%	14,644.78	3,661.20	7.6%
3:15 PM	4,326.39	1,081.60	2.2%	17,519.06	4,379.77	9.1%	18,551.28	4,637.82	9.6%
3:30 PM	8,356.91	2,089.23	4.3%	20,703.44	5,175.86	10.7%	24,361.63	6,090.41	12.6%
3:45 PM	16,478.81	2,801.40	8.5%	25,341.40	4,308.04	13.1%	31,238.25	5,310.50	16.2%
3:51 PM	20,752.34	1,037.62	10.7%	27,332.02	1,366.60	14.1%	34,651.03	1,732.55	17.9%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

DECEMBER 13

Mirror date: December 28
Analysis hours: 8:15 AM-3:52 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	37,786.60	4,534.39	19.5%	55,361.84	6,643.42	28.6%	55,361.84	6,643.42	28.6%
8:30 AM	22,875.58	5,718.90	11.8%	45,741.27	11,435.32	23.7%	45,741.27	11,435.32	23.7%
8:45 AM	12,994.05	3,248.51	6.7%	39,534.45	9,883.61	20.4%	39,534.45	9,883.61	20.4%
9:00 AM	6,791.93	1,697.98	3.5%	32,875.74	8,218.94	17.0%	32,875.74	8,218.94	17.0%
9:15 AM	2,917.67	729.42	1.5%	27,525.68	6,881.42	14.2%	27,525.68	6,881.42	14.2%
9:30 AM	1,180.76	295.19	0.6%	22,510.30	5,627.58	11.6%	22,510.30	5,627.58	11.6%
9:45 AM	930.20	232.55	0.5%	19,637.84	4,909.46	10.2%	19,637.84	4,909.46	10.2%
10:00 AM	592.05	148.01	0.3%	17,318.07	4,329.52	9.0%	17,318.07	4,329.52	9.0%
10:15 AM	257.77	64.44	0.1%	15,856.49	3,964.12	8.2%	15,856.49	3,964.12	8.2%
10:30 AM	67.05	16.76	0.0%	14,448.22	3,612.05	7.5%	14,448.22	3,612.05	7.5%
10:45 AM	18.97	4.74	0.0%	13,617.12	3,404.28	7.0%	13,617.12	3,404.28	7.0%
11:00 AM	0.00	0.00	0.0%	12,690.24	3,172.56	6.6%	12,690.24	3,172.56	6.6%
11:15 AM	0.00	0.00	0.0%	12,223.27	3,055.82	6.3%	12,223.27	3,055.82	6.3%
11:30 AM	0.00	0.00	0.0%	11,606.89	2,901.72	6.0%	11,606.89	2,901.72	6.0%
11:45 AM	0.00	0.00	0.0%	11,053.50	2,763.37	5.7%	11,053.50	2,763.37	5.7%
12:00 PM	0.00	0.00	0.0%	10,336.99	2,584.25	5.3%	10,336.99	2,584.25	5.3%
12:15 PM	0.00	0.00	0.0%	10,120.56	2,530.14	5.2%	10,120.56	2,530.14	5.2%
12:30 PM	0.00	0.00	0.0%	9,756.49	2,439.12	5.0%	9,756.49	2,439.12	5.0%
12:45 PM	0.00	0.00	0.0%	9,786.33	2,446.58	5.1%	9,786.33	2,446.58	5.1%
1:00 PM	0.00	0.00	0.0%	9,665.25	2,416.31	5.0%	9,665.25	2,416.31	5.0%
1:15 PM	0.00	0.00	0.0%	9,927.46	2,481.86	5.1%	9,927.46	2,481.86	5.1%
1:30 PM	0.00	0.00	0.0%	10,044.22	2,511.06	5.2%	10,044.22	2,511.06	5.2%
1:45 PM	0.00	0.00	0.0%	10,542.73	2,635.68	5.5%	10,542.73	2,635.68	5.5%
2:00 PM	0.00	0.00	0.0%	10,905.95	2,726.49	5.6%	10,905.95	2,726.49	5.6%
2:15 PM	0.00	0.00	0.0%	11,697.59	2,924.40	6.1%	11,697.59	2,924.40	6.1%
2:30 PM	90.07	22.52	0.0%	12,473.88	3,118.47	6.5%	12,473.88	3,118.47	6.5%
2:45 PM	548.82	137.21	0.3%	13,886.75	3,471.69	7.2%	13,886.75	3,471.69	7.2%
3:00 PM	1,698.80	424.70	0.9%	15,504.73	3,876.18	8.0%	15,508.07	3,877.02	8.0%
3:15 PM	4,190.37	1,047.59	2.2%	18,533.58	4,633.39	9.6%	19,405.04	4,851.26	10.0%
3:30 PM	8,190.13	2,047.53	4.2%	21,785.00	5,446.25	11.3%	24,959.63	6,239.91	12.9%
3:45 PM	16,042.38	2,887.63	8.3%	26,699.69	4,805.94	13.8%	31,871.44	5,736.86	16.5%
3:52 PM	20,804.64	1,248.28	10.8%	28,989.27	1,739.36	15.0%	36,247.69	2,174.86	18.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square

DECEMBER 20

Winter solstice (December 21 similar)
Analysis hours: 8:19 AM-3:54 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	38,213.23	3,057.06	19.8%	56,152.55	4,492.20	29.0%	56,152.55	4,492.20	29.0%
8:30 AM	26,376.41	5,539.05	13.6%	48,577.55	10,201.29	25.1%	48,577.55	10,201.29	25.1%
8:45 AM	15,361.49	3,840.37	7.9%	42,516.78	10,629.19	22.0%	42,516.78	10,629.19	22.0%
9:00 AM	8,272.62	2,068.16	4.3%	35,056.09	8,764.02	18.1%	35,056.09	8,764.02	18.1%
9:15 AM	3,737.23	934.31	1.9%	29,532.24	7,383.06	15.3%	29,532.24	7,383.06	15.3%
9:30 AM	1,258.54	314.63	0.7%	24,278.35	6,069.59	12.6%	24,278.35	6,069.59	12.6%
9:45 AM	1,017.13	254.28	0.5%	20,722.46	5,180.61	10.7%	20,722.46	5,180.61	10.7%
10:00 AM	726.94	181.73	0.4%	18,197.13	4,549.28	9.4%	18,197.13	4,549.28	9.4%
10:15 AM	369.69	92.42	0.2%	16,592.24	4,148.06	8.6%	16,592.24	4,148.06	8.6%
10:30 AM	116.47	29.12	0.1%	15,055.90	3,763.98	7.8%	15,055.90	3,763.98	7.8%
10:45 AM	30.03	7.51	0.0%	14,152.87	3,538.22	7.3%	14,152.87	3,538.22	7.3%
11:00 AM	0.00	0.00	0.0%	13,166.62	3,291.66	6.8%	13,166.62	3,291.66	6.8%
11:15 AM	0.00	0.00	0.0%	12,659.45	3,164.86	6.5%	12,659.45	3,164.86	6.5%
11:30 AM	0.00	0.00	0.0%	12,005.93	3,001.48	6.2%	12,005.93	3,001.48	6.2%
11:45 AM	0.00	0.00	0.0%	11,526.70	2,881.67	6.0%	11,526.70	2,881.67	6.0%
12:00 PM	0.00	0.00	0.0%	10,734.13	2,683.53	5.6%	10,734.13	2,683.53	5.6%
12:15 PM	0.00	0.00	0.0%	10,471.00	2,617.75	5.4%	10,471.00	2,617.75	5.4%
12:30 PM	0.00	0.00	0.0%	10,075.09	2,518.77	5.2%	10,075.09	2,518.77	5.2%
12:45 PM	0.00	0.00	0.0%	10,078.59	2,519.65	5.2%	10,078.59	2,519.65	5.2%
1:00 PM	0.00	0.00	0.0%	9,929.65	2,482.41	5.1%	9,929.65	2,482.41	5.1%
1:15 PM	0.00	0.00	0.0%	10,167.96	2,541.99	5.3%	10,167.96	2,541.99	5.3%
1:30 PM	0.00	0.00	0.0%	10,262.35	2,565.59	5.3%	10,262.35	2,565.59	5.3%
1:45 PM	0.00	0.00	0.0%	10,739.86	2,684.96	5.6%	10,739.86	2,684.96	5.6%
2:00 PM	0.00	0.00	0.0%	11,078.97	2,769.74	5.7%	11,078.97	2,769.74	5.7%
2:15 PM	0.00	0.00	0.0%	11,844.05	2,961.01	6.1%	11,844.05	2,961.01	6.1%
2:30 PM	39.24	9.81	0.0%	12,594.92	3,148.73	6.5%	12,594.92	3,148.73	6.5%
2:45 PM	432.11	108.03	0.2%	13,973.68	3,493.42	7.2%	13,973.68	3,493.42	7.2%
3:00 PM	1,455.42	363.85	0.8%	15,518.18	3,879.54	8.0%	15,518.18	3,879.54	8.0%
3:15 PM	3,705.84	926.46	1.9%	18,493.10	4,623.27	9.6%	19,163.55	4,790.89	9.9%
3:30 PM	7,373.48	1,843.37	3.8%	21,623.09	5,405.77	11.2%	24,171.18	6,042.80	12.5%
3:45 PM	14,525.68	3,050.39	7.5%	26,534.58	5,572.26	13.7%	31,275.97	6,567.95	16.2%
3:54 PM	20,828.35	1,666.27	10.8%	29,627.65	2,370.21	15.3%	36,860.56	2,948.84	19.1%

EXHIBIT F: QUANTITATIVE SHADOW DATA

Quantitative Shadow Data for Franklin Square Playground

Shadow data for existing conditions, net new shadow from project, and cumulative condition shadow

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

JUNE 21

Summer solstice
Analysis hours: 6:46 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	451.91	135.57	4.1%
7:36 PM	146.08	26.29	1.3%	0.00	0.00	0.0%	6,281.61	1,130.69	56.7%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

JUNE 28

Mirror date: June 14
Analysis hours: 6:48 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	309.35	92.81	2.8%
7:36 PM	140.69	25.32	1.3%	0.00	0.00	0.0%	6,320.89	1,137.76	57.1%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

JULY 5

Mirror date: June 7
Analysis hours: 6:52 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	0.01	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	483.02	144.91	4.4%
7:36 PM	122.38	22.03	1.1%	0.00	0.00	0.0%	6,444.24	1,159.96	58.2%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

JULY 12

Mirror date: May 31
Analysis hours: 6:56 AM-7:33 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	1,127.05	315.57	10.2%
7:33 PM	92.62	13.89	0.8%	0.00	0.00	0.0%	6,668.84	1,000.33	60.2%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

JULY 19

Mirror date: May 24
Analysis hours: 7:01 AM-7:30 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:16 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	2,357.78	589.45	21.3%
7:30 PM	51.58	6.71	0.5%	0.00	0.00	0.0%	7,219.68	938.56	65.2%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

JULY 26

Mirror date: May 17
Analysis hours: 7:07 AM-7:25 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	0.40	0.02	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	4,204.42	882.93	38.0%
7:25 PM	3.69	0.33	0.0%	0.00	0.00	0.0%	7,926.19	713.36	71.6%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

AUGUST 2

Mirror date: May 10
Analysis hours: 7:12 AM-7:18 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	40.40	0.81	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	908.51	227.13	8.2%
7:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	6,616.89	992.53	59.7%
7:18 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	8,329.74	249.89	75.2%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

AUGUST 9

Mirror date: May 3
Analysis hours: 7:19 AM-7:10 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	61.57	5.54	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:10 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	8,475.65	1,779.89	76.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

AUGUST 16

Mirror date: April 26
Analysis hours: 7:25 AM-7:02 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	68.26	2.73	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	513.74	138.71	4.6%
7:02 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	8,142.69	1,139.98	73.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

AUGUST 23

Mirror date: April 19
Analysis hours: 7:31 AM-6:52 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	259.20	28.51	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	3,154.17	599.29	28.5%
6:52 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	7,294.81	437.69	65.9%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

AUGUST 30

Mirror date: April 12
Analysis hours: 7:37 AM-6:42 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	136.51	8.19	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	917.67	211.06	8.3%
6:42 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	5,051.17	555.63	45.6%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

SEPTEMBER 6

Mirror date: April 5
Analysis hours: 7:44 AM-6:31 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	33.01	4.29	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	70.03	18.91	0.6%
6:31 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	2,717.22	380.41	24.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

SEPTEMBER 13

Mirror date: March 29
Analysis hours: 7:50 AM-6:21 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	270.00	48.60	2.4%
6:21 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	826.09	41.30	7.5%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

SEPTEMBER 20

Fall equinox (Spring equinox on March 22 similar)
Analysis hours: 7:57 AM-6:09 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:09 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

SEPTEMBER 27

Mirror date: March 15
Analysis hours: 8:03 AM-5:58 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:58 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

OCTOBER 4

Mirror date: March 8
Analysis hours: 8:09 AM-5:47 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	0.00	0.00	0.0%	71.49	2.86	0.6%	71.49	2.86	0.6%
8:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:47 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

OCTOBER 11

Mirror date: March 1
Analysis hours: 8:16 AM-5:37 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	0.00	0.00	0.0%	1,574.76	188.97	14.2%	1,574.76	188.97	14.2%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:37 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

OCTOBER 18

Mirror date: February 22
Analysis hours: 8:22 AM-5:27 PM (PDT)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	0.00	0.00	0.0%	3,857.42	231.45	34.8%	3,857.42	231.45	34.8%
8:30 AM	0.00	0.00	0.0%	1,920.66	345.72	17.3%	1,920.66	345.72	17.3%
8:45 AM	0.00	0.00	0.0%	146.06	36.52	1.3%	146.06	36.52	1.3%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:27 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

OCTOBER 25

Mirror date: February 15
Analysis hours: 7:30 AM-4:18 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	0.00	0.00	0.0%	6,280.42	816.45	56.7%	6,280.42	816.45	56.7%
7:45 AM	0.00	0.00	0.0%	2,331.29	582.82	21.1%	2,331.29	582.82	21.1%
8:00 AM	0.00	0.00	0.0%	501.34	125.34	4.5%	501.34	125.34	4.5%
8:15 AM	0.00	0.00	0.0%	6.54	1.64	0.1%	6.54	1.64	0.1%
8:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:18 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

NOVEMBER 1

Mirror date: February 8
Analysis hours: 7:36 AM-4:10 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	0.00	0.00	0.0%	8,633.45	604.34	78.0%	8,633.45	604.34	78.0%
7:45 AM	0.00	0.00	0.0%	6,161.94	1,170.77	55.6%	6,161.94	1,170.77	55.6%
8:00 AM	0.00	0.00	0.0%	2,836.14	709.03	25.6%	2,836.14	709.03	25.6%
8:15 AM	0.00	0.00	0.0%	1,081.00	270.25	9.8%	1,081.00	270.25	9.8%
8:30 AM	0.00	0.00	0.0%	145.56	36.39	1.3%	145.56	36.39	1.3%
8:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:10 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

NOVEMBER 8

Mirror date: February 1
Analysis hours: 7:43 AM-4:03 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	0.00	0.00	0.0%	10,201.92	102.02	92.1%	10,201.92	102.02	92.1%
7:45 AM	0.00	0.00	0.0%	10,009.76	1,301.27	90.4%	10,009.76	1,301.27	90.4%
8:00 AM	0.00	0.00	0.0%	6,686.21	1,671.55	60.4%	6,686.21	1,671.55	60.4%
8:15 AM	0.00	0.00	0.0%	3,450.88	862.72	31.2%	3,450.88	862.72	31.2%
8:30 AM	0.00	0.00	0.0%	1,475.73	368.93	13.3%	1,475.73	368.93	13.3%
8:45 AM	0.00	0.00	0.0%	437.54	109.39	4.0%	437.54	109.39	4.0%
9:00 AM	0.00	0.00	0.0%	41.80	10.45	0.4%	41.80	10.45	0.4%
9:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	0.00	0.00	0.0%	238.22	59.56	2.2%	238.22	59.56	2.2%
4:00 PM	0.00	0.00	0.0%	31.06	4.66	0.3%	31.06	4.66	0.3%
4:03 PM	0.00	0.00	0.0%	1.08	0.03	0.0%	1.08	0.03	0.0%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

NOVEMBER 15

Mirror date: January 25
Analysis hours: 7:51 AM-3:57 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	0.00	0.00	0.0%	11,060.85	884.87	99.9%	11,060.85	884.87	99.9%
8:00 AM	0.00	0.00	0.0%	9,578.71	1,915.74	86.5%	9,578.71	1,915.74	86.5%
8:15 AM	0.00	0.00	0.0%	6,715.60	1,678.90	60.6%	6,715.60	1,678.90	60.6%
8:30 AM	0.00	0.00	0.0%	3,672.17	918.04	33.2%	3,672.17	918.04	33.2%
8:45 AM	0.00	0.00	0.0%	1,879.47	469.87	17.0%	1,879.47	469.87	17.0%
9:00 AM	0.00	0.00	0.0%	757.71	189.43	6.8%	757.71	189.43	6.8%
9:15 AM	0.00	0.00	0.0%	191.44	47.86	1.7%	191.44	47.86	1.7%
9:30 AM	0.00	0.00	0.0%	4.31	1.08	0.0%	4.31	1.08	0.0%
9:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	0.00	0.00	0.0%	11.10	2.77	0.1%	11.10	2.77	0.1%
3:15 PM	0.00	0.00	0.0%	133.10	33.28	1.2%	133.10	33.28	1.2%
3:30 PM	0.00	0.00	0.0%	534.56	133.64	4.8%	534.56	133.64	4.8%
3:45 PM	0.00	0.00	0.0%	632.75	145.53	5.7%	632.75	145.53	5.7%
3:57 PM	0.00	0.00	0.0%	231.06	25.42	2.1%	231.06	25.42	2.1%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

NOVEMBER 22

Mirror date: January 18
Analysis hours: 7:57 AM-3:54 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	0.00	0.00	0.0%	11,074.97	221.50	100.0%	11,074.97	221.50	100.0%
8:00 AM	0.00	0.00	0.0%	11,074.97	1,661.24	100.0%	11,074.97	1,661.24	100.0%
8:15 AM	0.00	0.00	0.0%	9,744.18	2,436.05	88.0%	9,744.18	2,436.05	88.0%
8:30 AM	0.00	0.00	0.0%	6,591.03	1,647.76	59.5%	6,591.03	1,647.76	59.5%
8:45 AM	0.00	0.00	0.0%	3,914.15	978.54	35.3%	3,914.15	978.54	35.3%
9:00 AM	0.00	0.00	0.0%	2,034.44	508.61	18.4%	2,034.44	508.61	18.4%
9:15 AM	0.00	0.00	0.0%	1,086.89	271.72	9.8%	1,086.89	271.72	9.8%
9:30 AM	0.00	0.00	0.0%	316.63	79.16	2.9%	316.63	79.16	2.9%
9:45 AM	0.00	0.00	0.0%	95.48	23.87	0.9%	95.48	23.87	0.9%
10:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	0.00	0.00	0.0%	120.73	30.18	1.1%	120.73	30.18	1.1%
3:00 PM	0.00	0.00	0.0%	370.53	92.63	3.3%	370.53	92.63	3.3%
3:15 PM	0.00	0.00	0.0%	839.93	209.98	7.6%	839.93	209.98	7.6%
3:30 PM	0.00	0.00	0.0%	1,152.05	288.01	10.4%	1,152.05	288.01	10.4%
3:45 PM	0.00	0.00	0.0%	983.74	196.75	8.9%	983.74	196.75	8.9%
3:54 PM	60.61	4.85	0.5%	591.99	47.36	5.3%	591.99	47.36	5.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

NOVEMBER 29

Mirror date: January 11
Analysis hours: 8:04 AM-3:51 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	0.00	0.00	0.0%	11,074.97	996.75	100.0%	11,074.97	996.75	100.0%
8:15 AM	0.00	0.00	0.0%	10,817.72	2,271.72	97.7%	10,817.72	2,271.72	97.7%
8:30 AM	0.00	0.00	0.0%	9,289.40	2,322.35	83.9%	9,289.40	2,322.35	83.9%
8:45 AM	0.00	0.00	0.0%	6,328.27	1,582.07	57.1%	6,328.27	1,582.07	57.1%
9:00 AM	0.00	0.00	0.0%	3,690.62	922.65	33.3%	3,690.62	922.65	33.3%
9:15 AM	0.00	0.00	0.0%	2,167.63	541.91	19.6%	2,167.63	541.91	19.6%
9:30 AM	0.00	0.00	0.0%	1,176.72	294.18	10.6%	1,176.72	294.18	10.6%
9:45 AM	0.00	0.00	0.0%	541.58	135.40	4.9%	541.58	135.40	4.9%
10:00 AM	0.00	0.00	0.0%	159.32	39.83	1.4%	159.32	39.83	1.4%
10:15 AM	0.00	0.00	0.0%	37.99	9.50	0.3%	37.99	9.50	0.3%
10:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	0.00	0.00	0.0%	27.08	6.77	0.2%	27.08	6.77	0.2%
2:30 PM	0.00	0.00	0.0%	164.81	41.20	1.5%	164.81	41.20	1.5%
2:45 PM	0.00	0.00	0.0%	565.39	141.35	5.1%	565.39	141.35	5.1%
3:00 PM	0.00	0.00	0.0%	1,017.96	254.49	9.2%	1,017.96	254.49	9.2%
3:15 PM	0.00	0.00	0.0%	1,480.51	370.13	13.4%	1,480.51	370.13	13.4%
3:30 PM	0.00	0.00	0.0%	1,715.03	428.76	15.5%	1,715.03	428.76	15.5%
3:45 PM	0.00	0.00	0.0%	1,347.99	242.64	12.2%	1,347.99	242.64	12.2%
3:51 PM	226.38	11.32	2.0%	986.70	49.34	8.9%	986.70	49.34	8.9%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

DECEMBER 6

Mirror date: January 4
Analysis hours: 8:10 AM-3:51 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	0.00	0.00	0.0%	11,074.97	443.00	100.0%	11,074.97	443.00	100.0%
8:15 AM	0.00	0.00	0.0%	11,074.97	1,882.74	100.0%	11,074.97	1,882.74	100.0%
8:30 AM	0.00	0.00	0.0%	10,493.41	2,623.35	94.7%	10,493.41	2,623.35	94.7%
8:45 AM	0.00	0.00	0.0%	8,605.81	2,151.45	77.7%	8,605.81	2,151.45	77.7%
9:00 AM	0.00	0.00	0.0%	5,478.28	1,369.57	49.5%	5,478.28	1,369.57	49.5%
9:15 AM	0.00	0.00	0.0%	3,455.60	863.90	31.2%	3,455.60	863.90	31.2%
9:30 AM	0.00	0.00	0.0%	2,003.96	500.99	18.1%	2,003.96	500.99	18.1%
9:45 AM	0.00	0.00	0.0%	1,232.53	308.13	11.1%	1,232.53	308.13	11.1%
10:00 AM	0.00	0.00	0.0%	549.78	137.45	5.0%	549.78	137.45	5.0%
10:15 AM	0.00	0.00	0.0%	221.08	55.27	2.0%	221.08	55.27	2.0%
10:30 AM	0.00	0.00	0.0%	64.53	16.13	0.6%	64.53	16.13	0.6%
10:45 AM	0.00	0.00	0.0%	5.85	1.46	0.1%	5.85	1.46	0.1%
11:00 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	0.00	0.00	0.0%	24.15	6.04	0.2%	24.15	6.04	0.2%
2:15 PM	0.00	0.00	0.0%	165.43	41.36	1.5%	165.43	41.36	1.5%
2:30 PM	0.00	0.00	0.0%	446.98	111.74	4.0%	446.98	111.74	4.0%
2:45 PM	0.00	0.00	0.0%	1,049.69	262.42	9.5%	1,049.69	262.42	9.5%
3:00 PM	0.00	0.00	0.0%	1,511.96	377.99	13.7%	1,511.96	377.99	13.7%
3:15 PM	0.00	0.00	0.0%	1,995.44	498.86	18.0%	1,995.44	498.86	18.0%
3:30 PM	0.00	0.00	0.0%	2,173.65	543.41	19.6%	2,173.65	543.41	19.6%
3:45 PM	0.00	0.00	0.0%	1,774.65	301.69	16.0%	1,774.65	301.69	16.0%
3:51 PM	355.02	17.75	3.2%	1,358.22	67.91	12.3%	1,358.22	67.91	12.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

DECEMBER 13

Mirror date: December 28
Analysis hours: 8:15 AM-3:52 PM (PST)

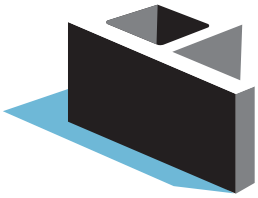
Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	0.00	0.00	0.0%	11,074.97	1,329.00	100.0%	11,074.97	1,329.00	100.0%
8:30 AM	0.00	0.00	0.0%	10,966.49	2,741.62	99.0%	10,966.49	2,741.62	99.0%
8:45 AM	0.00	0.00	0.0%	10,234.64	2,558.66	92.4%	10,234.64	2,558.66	92.4%
9:00 AM	0.00	0.00	0.0%	7,118.62	1,779.65	64.3%	7,118.62	1,779.65	64.3%
9:15 AM	0.00	0.00	0.0%	4,613.22	1,153.30	41.7%	4,613.22	1,153.30	41.7%
9:30 AM	0.00	0.00	0.0%	2,784.83	696.21	25.1%	2,784.83	696.21	25.1%
9:45 AM	0.00	0.00	0.0%	1,801.19	450.30	16.3%	1,801.19	450.30	16.3%
10:00 AM	0.00	0.00	0.0%	1,015.13	253.78	9.2%	1,015.13	253.78	9.2%
10:15 AM	0.00	0.00	0.0%	521.12	130.28	4.7%	521.12	130.28	4.7%
10:30 AM	0.00	0.00	0.0%	190.43	47.61	1.7%	190.43	47.61	1.7%
10:45 AM	0.00	0.00	0.0%	84.60	21.15	0.8%	84.60	21.15	0.8%
11:00 AM	0.00	0.00	0.0%	6.90	1.73	0.1%	6.90	1.73	0.1%
11:15 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	17.60	4.40	0.2%	17.60	4.40	0.2%
2:00 PM	0.00	0.00	0.0%	87.23	21.81	0.8%	87.23	21.81	0.8%
2:15 PM	0.00	0.00	0.0%	267.63	66.91	2.4%	267.63	66.91	2.4%
2:30 PM	0.00	0.00	0.0%	692.15	173.04	6.2%	692.15	173.04	6.2%
2:45 PM	0.00	0.00	0.0%	1,318.56	329.64	11.9%	1,318.56	329.64	11.9%
3:00 PM	0.00	0.00	0.0%	1,791.10	447.77	16.2%	1,791.10	447.77	16.2%
3:15 PM	0.00	0.00	0.0%	2,302.26	575.56	20.8%	2,302.26	575.56	20.8%
3:30 PM	0.00	0.00	0.0%	2,489.43	622.36	22.5%	2,489.43	622.36	22.5%
3:45 PM	0.00	0.00	0.0%	2,162.15	389.19	19.5%	2,162.15	389.19	19.5%
3:52 PM	423.77	25.43	3.8%	1,659.83	99.59	15.0%	1,691.63	101.50	15.3%

PROJECT: SFMTA Potrero Yard
OPEN SPACE: Franklin Square Playground Only

DECEMBER 20

Winter solstice (December 21 similar)
Analysis hours: 8:19 AM-3:54 PM (PST)

Analysis Time	EXISTING SHADOW			SFMTA POTRERO YARD NET NEW SHADOW			CUMULATIVE NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	0.00	0.00	0.0%	11,074.97	886.00	100.0%	11,074.97	886.00	100.0%
8:30 AM	0.00	0.00	0.0%	11,074.97	2,325.74	100.0%	11,074.97	2,325.74	100.0%
8:45 AM	0.00	0.00	0.0%	10,536.92	2,634.23	95.1%	10,536.92	2,634.23	95.1%
9:00 AM	0.00	0.00	0.0%	8,148.74	2,037.19	73.6%	8,148.74	2,037.19	73.6%
9:15 AM	0.00	0.00	0.0%	5,389.51	1,347.38	48.7%	5,389.51	1,347.38	48.7%
9:30 AM	0.00	0.00	0.0%	3,392.08	848.02	30.6%	3,392.08	848.02	30.6%
9:45 AM	0.00	0.00	0.0%	2,161.67	540.42	19.5%	2,161.67	540.42	19.5%
10:00 AM	0.00	0.00	0.0%	1,304.28	326.07	11.8%	1,304.28	326.07	11.8%
10:15 AM	0.00	0.00	0.0%	757.38	189.35	6.8%	757.38	189.35	6.8%
10:30 AM	0.00	0.00	0.0%	282.05	70.51	2.5%	282.05	70.51	2.5%
10:45 AM	0.00	0.00	0.0%	145.40	36.35	1.3%	145.40	36.35	1.3%
11:00 AM	0.00	0.00	0.0%	37.26	9.32	0.3%	37.26	9.32	0.3%
11:15 AM	0.00	0.00	0.0%	3.41	0.85	0.0%	3.41	0.85	0.0%
11:30 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	0.00	0.00	0.0%	27.68	6.92	0.2%	27.68	6.92	0.2%
2:00 PM	0.00	0.00	0.0%	99.85	24.96	0.9%	99.85	24.96	0.9%
2:15 PM	0.00	0.00	0.0%	281.99	70.50	2.5%	281.99	70.50	2.5%
2:30 PM	0.00	0.00	0.0%	705.29	176.32	6.4%	705.29	176.32	6.4%
2:45 PM	0.00	0.00	0.0%	1,342.85	335.71	12.1%	1,342.85	335.71	12.1%
3:00 PM	0.00	0.00	0.0%	1,829.38	457.34	16.5%	1,829.38	457.34	16.5%
3:15 PM	0.00	0.00	0.0%	2,364.28	591.07	21.3%	2,364.28	591.07	21.3%
3:30 PM	0.00	0.00	0.0%	2,615.82	653.95	23.6%	2,615.82	653.95	23.6%
3:45 PM	0.01	0.00	0.0%	2,418.50	507.88	21.8%	2,418.50	507.88	21.8%
3:54 PM	447.02	35.76	4.0%	1,780.31	142.42	16.1%	1,851.45	148.12	16.7%



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