Transbay Transit Center Program

Draft Supplemental Environmental Impact Statement/ Environmental Impact Report

December 2015

TJPA
TRANSBAY JOINT POWERS AUTHORITY

U.S. Department of Transportation
Federal Transit Administration

U.S. Department of Transportation
Federal Railroad Administration

Draft Supplemental Environmental Impact Statement/ Environmental Impact Report

for the

Transbay Transit Center Program

prepared by the

U.S. Department of Transportation
Federal Transit Administration

and the

Transbay Joint Powers Authority

pursuant to

National Environmental Policy Act (42 USC 4332), Public Transportation (49 USC 53), Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303 and 23 USC 138), National Historic Preservation Act (54 USC § 300101 et seq.), 40 CFR 1500-1508, 23 CFR 771, 23 CFR 774, Executive Order 12898, California Environmental Quality Act, PRC 21000 *et seq.*, and the State of California CEQA Guidelines, California Administrative Code, 1500 *et seq.* FTA may issue a single Final Environmental Impact Statement and Record of Decision document pursuant to Pub. L. 112-141, 126 Stat. 405, Section 1319 unless FTA determines statutory criteria or practicability considerations preclude issuance of the combined document pursuant to Section 1319.

Leslie T. Rogers
Region 9 Regional Administrator
Federal Transit Administration

DEC 15 2015
Date

Maria Ayerdi-Kaplan
Executive Director
Transbay Joint Powers Authority

12/11/15
Date

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Acronyms and Other Abbreviations

$YOE	year-of-expenditure dollars
°C	degrees Celsius
°F	degrees Fahrenheit
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing materials
AC Transit	Alameda–Contra Costa Transit District
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
ANSI	American National Standards Institute
APE	area of potential effects
APS	Alternative Planning Strategy
APTA	American Public Transit Association
ARDTP	Archaeological Research Design and Treatment Plan
ASCE	American Society of Civil Engineers
AWSS	Auxiliary Water Supply System
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
bgs	below ground surface
BMP	best management practice
BP	Before Present
C-3	Downtown Commercial Zone
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CAT	Climate Action Team
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDSM	Cement Deep Soil Mixed
Central SoMa Plan	Central South of Market Plan
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act

CFR	Code of Federal Regulations
CH_4	methane
CHP	California Highway Patrol
CHSRA	California High-Speed Rail Authority
City	City and County of San Francisco
CIWMB	California Integrated Waste Management Board
CNDDB	California Natural Diversity Data Base
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide
Cortese List	California Hazardous Waste and Substances Site List
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
DB	design-build
dBA	A-weighted decibels
DBB	design-bid-build
DBI	San Francisco Department of Building Inspection
DEM	San Francisco Department of Emergency Management
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DPW	San Francisco Department of Public Works
DTSC	California Department of Toxic Substances Control
DTX	Downtown Rail Extension
DURF	Demolition, Utility Relocation, New Transit Center Foundation Excavation
EDR	Environmental Data Resources
EMF	electromagnetic field
EMI	electromagnetic interference
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESCP	Erosion and sediment control plan
ETB	electronic trolley bus
FCC	Federal Communications Commission
FEIS/EIR	2004 Final EIS/EIR
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FOE	Findings of Effect

FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
gpd	gallon per day
gpm	gallons per minute
GWP	global warming potential
HCM	Highway Capacity Manual
HMMP	hazardous materials management/business plan
HSR	High Speed Rail
I	Interstate
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers
IPCC	Intergovernmental Panel on Climate Change
ISO	Independent System Operator
LCFS	Low-Carbon Fuel Standard
L_{dn}	day-night noise levels
LEP	low English language proficiency
L_{eq}	equivalent noise level
LOS	level of service
LPA	Locally Preferred Alternative
LUST	leaking underground storage tank
MAP-21	Moving Ahead for Progress in the 21st Century
MBTA	Migratory Bird Treaty Act
mG	milligauss
mgd	million gallons per day
MHHW	Mean higher high water
MHz	megahertz
MMRP	Mitigation Monitoring and Reporting Program
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOW	maintenance of way
MPE	maximum permissible exposure
mph	miles per hour
MPO	Metropolitan Planning Organization
MTA	San Francisco Municipal Transportation Agency
MTC	Metropolitan Transportation Commission
Muni	San Francisco Municipal Railway
MUO	Mixed-Use Office
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission

NATM	New Austrian Tunneling Method
NEHRP	National Earthquake Hazards Reduction Program
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	National Research Council
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O_3	ozone
OCII	San Francisco Office of Community Investment and Infrastructure
OCS	overhead catenary system
OPR	California Office of Planning and Research
OSHA	U.S. Occupational Safety and Health Administration
OWSC	one-way stop controlled
P3/DBFM	public-private-partnership/design-build-finance-maintain
PCB	polychlorinated biphenyl
PCE	perchloroethylene
PCEP	Peninsula Corridor Electrification Project
PDR	production, distribution, and repair
PG&E	Pacific Gas and Electric Company
PM_{10}	respirable particulate matter
$PM_{2.5}$	fine particulate matter
POAQC	Projects of Air Quality Concern
POPOS	privately owned public open spaces
Port	Port of San Francisco
Porter-Cologne Act	California Porter-Cologne Water Quality Control Act of 1969
ppm	parts per million
PRC	Public Resources Code
RCRA	Resource Conservation and Recovery Act
RMS	root mean square
ROD	Record of Decision
ROG	reactive organic gas
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users

SB	Senate Bill
SCS	Sustainable Communities Strategy
SEIS/EIR	Supplemental Environmental Impact Statement/Environmental Impact Report
SEM	Sequential Excavation Method
SFBAAB	San Francisco Bay Area Air Basin
SFDPH	San Francisco Department of Public Health
SFFD	San Francisco Fire Department
SFHA	Special Flood Hazard Area
SFMTA	San Francisco Municipal Transportation Agency
SFOBB	San Francisco - Oakland Bay Bridge
SFPD	San Francisco Police Department
SFPUC	San Francisco Public Utilities Commission
SFRA	San Francisco Redevelopment Agency
SFRP`	San Francisco Recreation and Parks Department
SFSD	San Francisco Sheriff's Department
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SoMa	South of Market
SUD	Supplemental Use District
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCDP	Transit Center District Plan
THPO	Tribal Historic Preservation Officer
TJPA	Transbay Joint Powers Authority
tpph/d	trains per peak hour per direction
Transbay Program	Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project
Transit Center	Transbay Transit Center
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UWMP	Urban Water Management Plan
VdB	velocity in decibels
VDECS	Verified Diesel Emissions Control Strategy
VMT	Vehicle miles traveled
VOC	volatile organic compound
WSIP	Water System Improvement Program
$\mu g/m^3$	micrograms per cubic meter

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SUMMARY

S1 WHAT IS THIS REPORT?

The Federal Transit Administration (FTA), in cooperation with the Federal Railroad Administration and the Transbay Joint Powers Authority (TJPA), prepared this environmental analysis to supplement and update an earlier report certified by the TJPA in 2004 and adopted by FTA in 2005. The 2004 report evaluated the environmental and socioeconomic effects of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Transbay Program), a proposal for a vibrant new neighborhood in San Francisco organized around the transit center currently under construction, and for an extension of the Caltrain commuter rail service to this new transit center. The 2004 document is the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Final Environmental Impact Statement/ Environmental Impact Report (2004 FEIS/EIR).

This Supplemental EIS/EIR (SEIS/EIR) incorporates by reference information contained in the 2004 FEIS/EIR and evaluates refinements to the Downtown Rail Extension (DTX) component of the Transbay Program, as well as other transportation improvements and development opportunities associated with the Transbay Program. The changes are collectively referred to as the "proposed project."

The purpose of this SEIS/EIR is to examine the following:

- new potentially significant environmental impacts or substantially more severe impacts of the proposed project compared to those identified in the 2004 analysis,
- changes in circumstances and changes in existing conditions under which the proposed project would be implemented, and
- new information as required by federal (National Environmental Policy Act [NEPA]) and state (California Environmental Quality Act [CEQA]) environmental legislation.

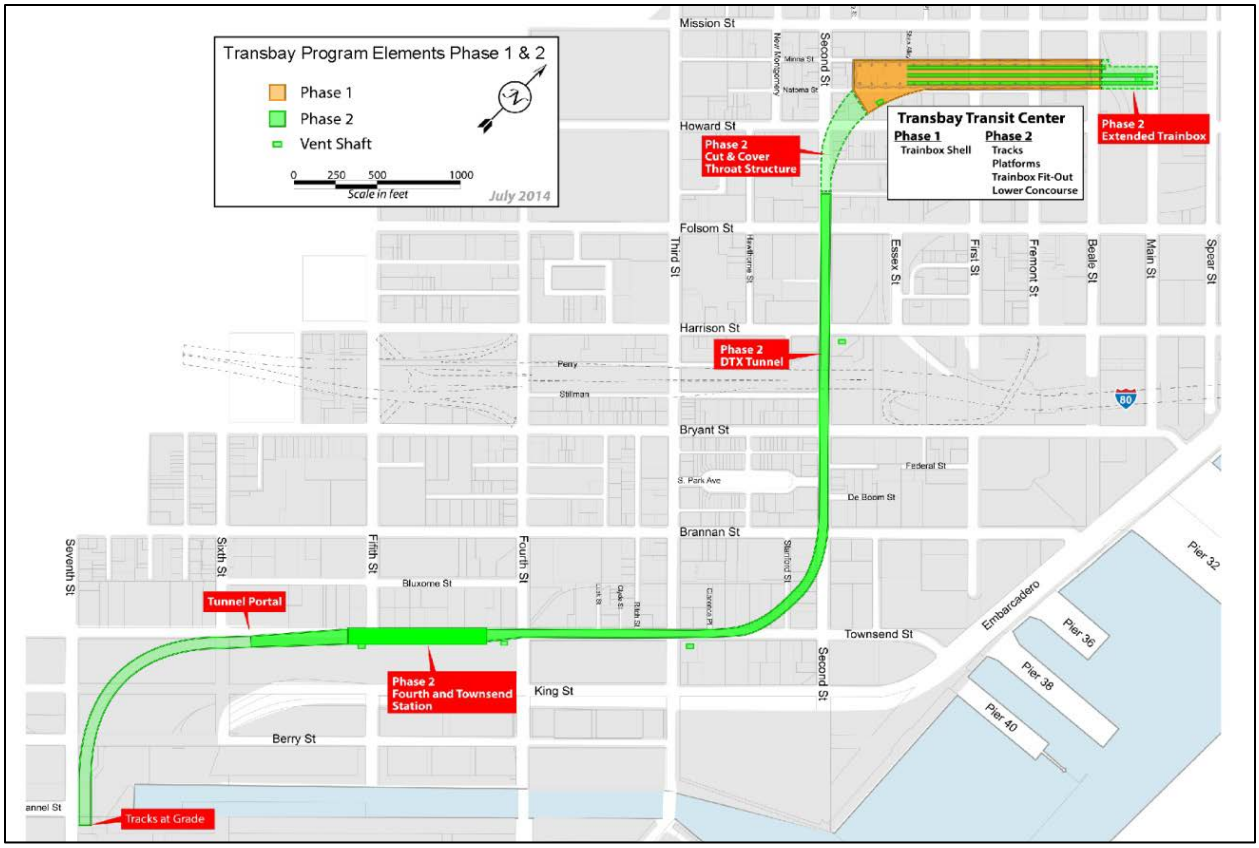
S2 WHAT IS THE TRANSBAY PROGRAM?

The Transbay Program is a visionary and transformative plan to reshape an area of the city of San Francisco near the downtown and financial core. The program was developed to:

- improve public access to bus and rail services,
- modernize the Transbay Terminal and improve service,
- reduce non-transit vehicle usage, and
- alleviate blight and revitalize the Transbay Terminal area.

The interrelated improvements and plans intended to make this vision a reality were approved in 2004 and 2005 by the U.S. Department of Transportation, FTA; the City and County of San Francisco (City); the Peninsula Corridor Joint Powers Board; and the San Francisco Redevelopment Agency (now known as the San Francisco Office of Community Investment and Infrastructure). These agencies saw the Transbay Program as a way to transform the outdated intermodal transit connection at the Transbay Terminal into a modern, dynamic transit center; create a lively mixed-use area to complement transit services; enhance local and regional connectivity to the San Francisco Bay Area's robust transit systems; and advance the region's environmental goals to improve air quality.

The Transbay Program is divided into two construction phases: Phase 1 and Phase 2 (see Figure S-1). Phase 1 consists of the above-ground portion of the new Transit Center and the train box, which is the subterranean portion of the Transit Center that will house the Caltrain and high-speed rail (HSR) station. Phase 1 will create a "Grand Central Station of the West" in the heart of a new transit-friendly neighborhood. The station will serve eight Bay Area counties and the rest of California through 11 transit systems: AC Transit, Bay Area Rapid Transit (BART), Caltrain, Golden Gate Transit, Greyhound, San Francisco Municipal Railway (Muni), SamTrans, WestCAT Lynx, Amtrak, Paratransit, and future HSR service. Phase 1 commenced in 2008 with construction of the Temporary Terminal. Construction of the new Transit Center is underway, and is anticipated to be completed in 2017. Phase 2 primarily will include completion of the Transit Center below-grade levels and the DTX for Caltrain and HSR.



Sources: City and County of San Francisco 2013; compiled by the TJPA 2014

Figure S-1 Transbay Program Elements, Phases 1 and 2

Caltrain is a vital regional commuter rail service connecting San Francisco to the Peninsula, Silicon Valley, and San Jose, but its current northern terminus in San Francisco is approximately 2 miles from downtown and the financial and office core of the city. DTX will provide this "missing link," allowing convenient connections to the other transportation services available at the Transit Center.

HSR is a statewide, 800-mile rail system, planned to connect the mega-regions of the state, such as the San Francisco Bay Area, Sacramento, the Central Valley, the Los Angeles Basin, and San Diego. The system will offer high-speed rail service between San Francisco and Los Angeles in under 3 hours at speeds capable of over 220 miles per hour.

DTX will be underground and will connect a new underground Fourth and Townsend Street Station, adjacent to the existing Caltrain terminus and railyard, with the underground train station at the Transit Center. After its construction, the Transit Center will accommodate more than 100,000 passengers each weekday and up to 45 million people per year, making public transportation a convenient and accessible option for everyone who lives, works, and visits the San Francisco Bay Area.

The estimates of the number of Caltrain and HSR trains that will use the Transit Center, and the associated ridership, will be refined by the TJPA, Caltrain, and the California High-Speed Rail Authority, based on the final platform and track design at the Transit Center and the service plans of the providers.

S3 HOW WOULD THE TRANSBAY PROGRAM CHANGE AS A RESULT OF THE PROPOSED PROJECT?

The proposed project makes minor changes to the Transbay Program. The proposed project seeks to advance the original goals and objectives of the Transbay Program. Three types of changes are proposed and are analyzed in this SEIS/EIR:

- Refining the design of Phase 2, including the DTX, to enhance rail operations, improve safety with refined emergency ventilation/ smoke evacuation structures, conform to design specifications needed for HSR service, and improve methods for constructing the mined tunnel segment.
- Providing other transportation improvements to enhance connectivity and services in the area, including an intercity bus facility, a bicycle ramp into the Transit Center, taxi staging areas adjacent to the Transit Center, and a pedestrian connector to BART.
- Allowing land development adjacent to some of the above-ground transportation facilities where not all of the land is needed for the facilities. (This change is a local proposal and, since it would not require federal approval, funding, or permits, this change is not a part of the NEPA action.)

Table S-1 describes each of these proposed project components. Some of the components were previously evaluated in the 2004 FEIS/EIR but are proposed to be modified, such as features related to the DTX. Other components are new and are identified as such in Table S-1. Figure S-2 shows the location of the proposed project components. Detailed descriptions of these changes are presented in Chapter 2 of this SEIS/EIR.

These proposed project components would not affect the number of trains that would serve the Transit Center or the number of daily passengers projected to ride Caltrain and HSR. The proposed project would, however, enable the planned HSR service to serve the Transit Center. Although this service was envisioned in 2004, design specifications for the tracks and platforms became available after the 2004 FEIS/EIR was approved, and triggered some of the modifications that are part of the proposed project.

Another important change that has occurred is the adoption by the City of a land use plan for the vicinity of the Transit Center in 2012. The Transit Center District Plan (TCDP) establishes a land use program for 145 acres surrounding the Transit Center, including almost all of the land proposed for redevelopment in the Transbay Program. The TCDP intensifies the development potential in the plan area by creating land use designations that will extend the financial office core into the south of Market Street area; enhance the streetscape, pedestrian walkways, and streets for bicyclists and automobiles; increase open space; promote environmental sustainability; and protect historic resources. The TCDP authorizes an additional 2.2 million square feet of office space, more than 800 additional housing units, and more than 800 additional hotel rooms than the previous zoning regulations. The City's plan complements the TJPA's major transit investment. It capitalizes on the new transportation infrastructure and generates revenues to support completion of the Transbay Program and other public improvements.

S4 ARE THERE NEW CIRCUMSTANCES OR INFORMATION THAT HAVE OCCURRED SINCE THE TRANSBAY PROGRAM APPROVAL?

The Transbay Program covers an area of the city that rapidly is transforming.

Area Plans

Since the 2004 FEIS/EIR, a number of area plans and projects have been approved that could change the circumstances and the existing and cumulative conditions under which the project would be constructed. The City's TCDP envisions a more intensely developed area that will extend the financial center south of Market Street. The City also is advancing the Central South of Market Plan (Central SoMa Plan) to promote mixed-use

Table S-1
Proposed Project

Proposed Project Components	Change from the Approved Transbay Program
Refinements to DTX	
• **Widened throat structure** – The throat structure provides the connection between the underground tracks and the train box below the Transit Center. It is the area where the alignment narrows at the west end of the train box to continue along Second Street. The width of the alignment depends on the curvature of the tracks. It is proposed to be widened to conform to design specifications required for high-speed rail (HSR) service.	• The approved design has curves with a radius of less than 545 feet (TJPA 2011); the revised design calls for a 650-foot radius, which minimizes significant additional land acquisition.
• **Extended train box** – The underground train box would be extended east one block to Main Street.	• The approved design has the eastern end of the train box terminating at Beale Street. The extension is proposed to be compatible with platform design specifications from the California High-Speed Rail Authority and create the opportunity for a more direct route for the planned pedestrian connection to the Bay Area Rapid Transit (BART)/San Francisco Municipal Railway (Muni) station on Market Street.
• **Realigned Fourth and Townsend Street Station** – The underground station would be realigned to parallel Townsend Street.	• The approved design has the station slightly skewed, partially in the Caltrain railyard and partially in Townsend Street. The revision would improve operations and support City and County of San Francisco (City) planning efforts.
• **Vent structures** – Emergency ventilation/smoke evacuation structures would be co-located with emergency tunnel exits at the following locations: - Fourth and Townsend Street Station, one at each end - 701 Third Street (Third and Townsend Streets) or across the street at 699 Third Street and 180 Townsend Street - Second and Harrison Streets (southeast corner) - Transit Center, one at each end Additionally, two exhaust fans would be located at the west end of the Transit Center. They would be covered at grade until needed for DTX operations. The height of the vent structures would vary depending on adjacent development and would be sufficiently tall to avoid affecting adjacent uses.	• The approved design includes vent structures but in different locations, and does not require as many ventilation shafts or the additional exhaust fans at the Transit Center. The design and siting for the ventilation structures continues to follow National Fire Protection Association Standard 130. The heights of the structure have also changed to account for type and height of adjacent uses at the new locations.
• **Tunnel stub box** – A new below-grade train box at the west end of the railyard would be constructed to accommodate future grade separations and expedite future arrival of below-grade Caltrain and HSR trains.	• *New component.* The approved project includes a retained-cut structure, or U-wall, for trains to transition between the underground Fourth and Townsend Street Station and the at-grade alignment to the south. The tunnel stub box would be beneath the U-wall.
• **Rock dowels** – Rock dowels are approximately 15-foot-long rods that would be installed along the tunnel mined segment.	• *New component.* Installation of the rock dowels would improve safety during construction of the tunnel and reduce risks of settlement and collapse.
• **Additional trackwork south of the Caltrain railyard** – A turnback track and maintenance of way storage track would be constructed within the existing Caltrain right-of-way between Hooper Street and Mariposa Street, immediately east of Seventh Street.	• *New component.* The approved design does not include specific proposals for additional at-grade trackwork within the existing right-of-way.

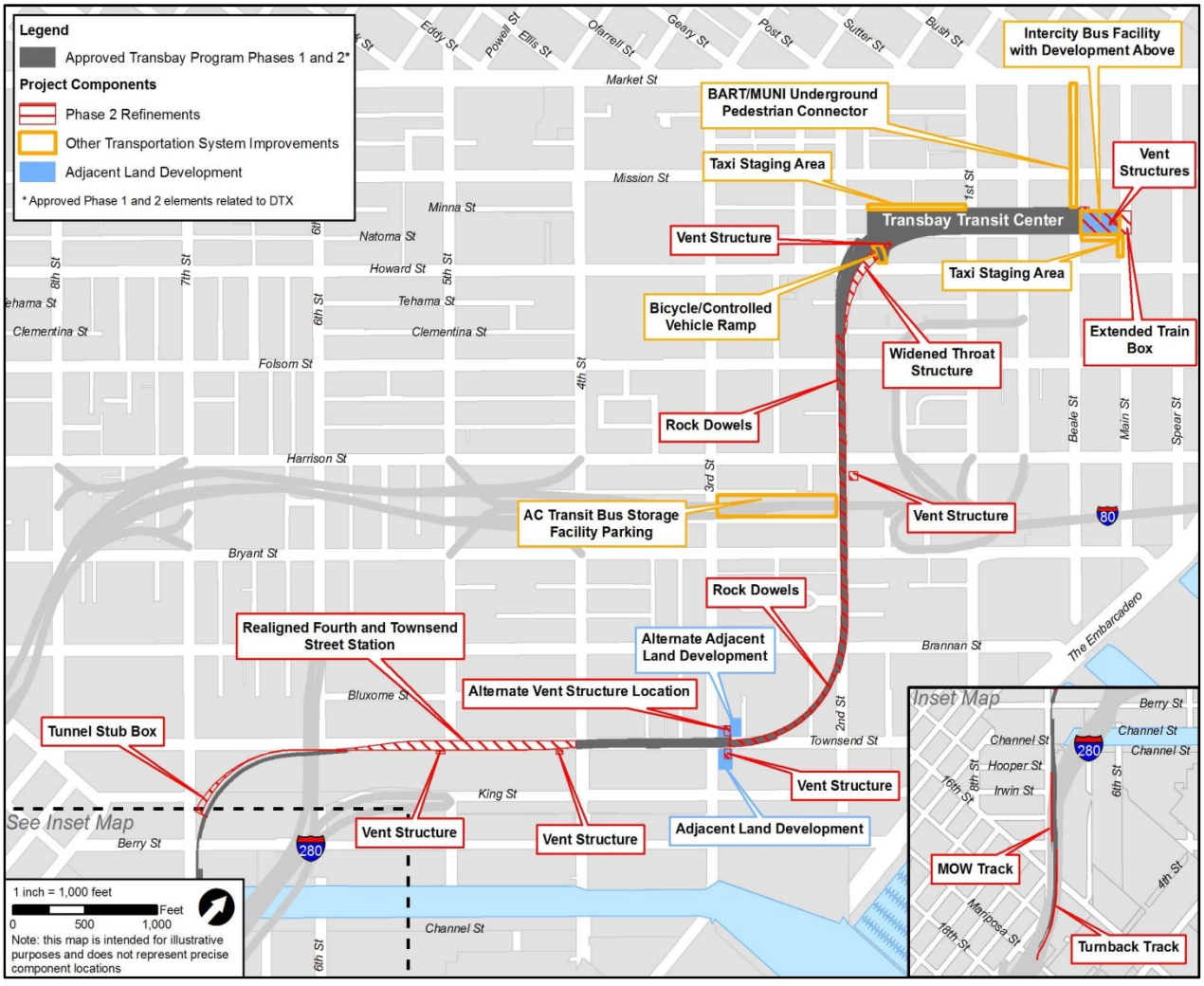
Table S-1
Proposed Project

Proposed Project Components	Change from the Approved Transbay Program
Other Transportation Improvements	
• **Intercity bus facility** – A new bus facility would be constructed above the extended train box, between Beale and Main Streets, east of and across Beale Street from the Transit Center. It would serve Amtrak and private bus operators such as Greyhound.	• *New component.* The approved design includes bus berths for Greyhound within the Transit Center but does not accommodate Amtrak. The proposed improvement would take advantage of the area above the extended train box.
• **Taxi staging area** – Curbside passenger loading and unloading spaces for taxis would be provided along the south side of Minna Street between First and Second Streets, along the north side of New Natoma Street between Beale and Main Streets, and along the west side of Main Street between New Natoma and Howard Streets.	• *New component.* The proposed project identifies spaces that would be convenient for passengers coming to or leaving the Transit Center and consistent with the City's street improvement plans.
• **Bicycle/controlled vehicle ramp** – A bicycle ramp would be constructed from Howard Street to below-grade bicycle facilities within the Transit Center. A separate controlled vehicle ramp would also run parallel to the bike ramp to access the Lower Concourse level.	• *New component.* The approved design does not include specific proposals for a bicycle/controlled vehicle ramp. The proposed project would reduce conflicts for pedestrians, bicyclists, and motorists, and improve access to the bicycle storage area.
• **AC Transit bus storage parking facility** – The proposed project would use the AC Transit bus storage facility for off-hours/nighttime or event parking (e.g., nighttime sporting or special events) when not in use by AC Transit for regular operations. The AC Transit bus storage facility would have two potential modes of parking: 202 valet-parked spaces or 167 self-parked spaces.	• *New component.* The approved design includes a bus storage area for AC Transit. The proposed project would allow general public use of this facility when not needed by AC Transit and help offset the projected parking shortfall in the area with the future dining, entertainment, sporting, and other uses.
• **BART/Muni Underground Pedestrian Connector** – An 800-foot-long pedestrian connection underneath Beale Street would link the Embarcadero BART/Muni Metro Station with the Transit Center.	• The approved design proposes an underground pedestrian connection under Fremont Street. The proposed project takes advantage of the extended train box to provide a more direct connection between the BART/Muni station on Market Street and the Transit Center under Beale Street.
Adjacent Land Development*	
• **Above the intercity bus facility** – The proposed project would include two floors above the intercity bus facility that could be developed by others (for a maximum of four stories above the street level). The development would be approximately 45,000 gross square feet. Two options are considered for this proposed project component: all office space (assuming 45,000 square feet) or all residential development (assuming a single-room-occupancy development with a maximum of 350 square feet per unit, resulting in 128 housing units).	• The approved Transbay Program includes 787,230 square feet of office and 61,205 square feet of retail space on the block that would include the intercity bus facility and the adjacent land development. The proposed adjacent land development would be consistent with the Transit Center District Plan that amends this development program and encourages the addition of housing.
• **Adjacent to the vent structure at either of the optional locations at Third and Townsend Streets** – The proposed project would allow 76,000 square feet of new development. City zoning regulations allow a mix of uses at both of the optional sites, including retail, office, and housing. While no specific development program has been established, it is assumed that a 4,000-square-foot restaurant and either 72,000 square feet of office space or residential development (72 units) up to 105 feet tall could be built adjacent to the vent structure at the southeast corner site option, or 72,000 square feet of office or other commercial space at the northeast corner site option up to 65 feet tall.	• *New component.* The approved Transbay Program did not include any new development at Third and Townsend Streets.

Table S-1
Proposed Project

Proposed Project Components	Change from the Approved Transbay Program

Note:
* This project component is included as part of the proposed project for the California Environmental Quality Act (CEQA) analysis. However, because the adjacent land development is not under Federal Transit Administration (FTA) jurisdiction, it is not considered part of the proposed action for the National Environmental Policy Act (NEPA) analysis. Under NEPA, future development of these sites to include additional land uses besides the transportation improvements is considered an indirect effect (40 CFR 1508.8).
Source: compiled by AECOM in 2013



Sources: City and County of San Francisco 2013; compiled by AECOM in 2015

Figure S-2 Proposed Project Components

development, museums, and entertainment venues along the Central Subway project currently under construction that is planned to open in 2019.

The Central SoMa Plan provides the vision and strategies to support change along and around the Fourth Street transit spine—a vision of changing land use patterns that will complement and capitalize on new transit infrastructure while protecting the area's eclectic population, blend of uses, and unique character. Because of these new plans, the land use patterns, development densities, mix of uses, and urban form have changed substantially since approval of the Transbay Program. Development that has been constructed pursuant to these plans is recognized as part of the existing conditions for this SEIS/EIR. Pending and future development and projects pursuant to these plans are considered in the cumulative analysis for this SEIS/EIR.

Transportation Improvements

In addition to these changes to the development and visual landscape, the area has seen transit investments since the 2004 FEIS/EIR, including the City's Better Streets Plan, the Bicycle Plan, the Transit Effectiveness Plan, and the above-mentioned Central Subway, for which ridership in 2030 is projected to be 35,100 daily boardings, according to the Central Subway website.

Population and Employment Growth

The 2010 U.S. Census indicates substantial growth in population and households and changes in the socioeconomic profile since the 2004 FEIS/EIR, which reported demographic information from the 2000 U.S. Census. Regional forecasts for the San Francisco Bay Area show a 30 percent increase in population between 2010 and 2040. San Francisco's population is projected to increase by 35 percent over that period, with the majority in the new neighborhoods south of Market Street and in the vicinity of the Transbay Program area.

This area also has been home to growth in the technology business sector, which helped pave the way for San Francisco County to become the fastest-growing large county in the U.S., as reported at the 2014 Annual Economic Briefing sponsored by the San Francisco Planning and Urban Research Association (SPUR), with a 6.1 percent increase in employment from 2011 to 2012 (triple the national growth rate of 2 percent). In short, the land use, visual, and socioeconomic setting of the Transbay Program vicinity is even more intense, dynamic, transit-oriented, and diverse than a decade ago when the program was adopted.

Regulatory Changes

The regulatory framework also has changed since the 2004 FEIS/EIR. The following are some of the key changes:

- Updated guidelines for assessing greenhouse gas (GHG) emissions from the Council on Environmental Quality in 2014 and the Bay Area Air Quality Management District (BAAQMD) in 2011;
- Updated guidelines for quantitative assessment of construction-related air pollutant emissions and health risk

assessments from the BAAQMD in 2011;

- New or expanded historic districts;
- More stringent water quality standards governing stormwater runoff;
- New flood hazard mapping and issuance of Executive Order 13690 in 2015, defining floodplains;
- Updated noise and vibration assessment guidelines from FTA in 2006;
- Updated guidance on environmental justice principles and analysis from FTA in 2012;
- Updated CEQA guidance for transportation and aesthetics in infill and transit priority areas in 2013;
- Adoption of the federal transportation authorization legislation in 2012, entitled Moving Ahead for Progress in the 21st Century ("MAP-21"), including new guidelines for implementing NEPA; and
- State legislation in 2008 mandating the integration of land use, transportation, and affordable housing at the regional level and requiring the Regional Transportation Plan to be consistent with a Sustainable Communities Strategy.

S5 WHAT ENVIRONMENTAL EFFECTS MIGHT RESULT FROM THE PROPOSED PROJECT?

Resource Topics Considered

This SEIS/EIR complies with NEPA and CEQA, and guidelines for their implementation. The following physical, environmental, and socioeconomic resource topics are evaluated:

- Transportation
- Land Use and Planning, Wind, and Shadow
- Socioeconomics, Population, and Housing
- Visual Quality/Aesthetics
- Historic and Cultural Resources
- Biological Resources
- Water Resources and Water Quality
- Geology, Soils, and Seismicity
- Hazardous Materials
- Electromagnetic Fields
- Noise and Vibration
- Air Quality
- Greenhouse Gases and Climate Change
- Public Services, Community Services, and Recreational Facilities
- Safety and Security
- Utilities
- Environmental Justice Communities
- Section 4(f) (Public Parks, Recreation Lands, Historic Sites, and Wildlife and Waterfowl Refuges)

Types of Environmental Effects

For each of these topics, the proposed project's direct and indirect operational, construction, and cumulative impacts are discussed. *Direct* impacts are the primary effects that would be caused by the proposed project and would occur at the same time and place. For the proposed project, direct impacts would be the result of implementing the proposed project components. *Indirect* impacts would be reasonably foreseeable secondary effects that would be caused by the proposed project but would occur at a different time or place. *Temporary* construction impacts would be those that would occur only during project construction, and would cease when the project entered the operational phase. *Cumulative* impacts would occur when two or more individual effects that,

when considered together, would be considerable, or that would compound or increase other environmental impacts.

Both NEPA and CEQA acknowledge that implementation of projects results in changes. However, both federal and state laws pay particular attention to those changes that are substantial and adverse. Pursuant to the Council on Environmental Quality's NEPA regulations (Code of Federal Regulations [CFR] Title 40, Sections 1500–1508), the significance of project effects is evaluated considering the effects' context, intensity, and duration. *Context* refers to the geographic area (spatial extent) of impact, which varies with the physical setting of the activity and the nature of the resource being analyzed. *Intensity* refers to the severity of the impact; evaluation of the intensity of an impact considers the sensitivity of the resource and other factors.

For CEQA, Appendix G of the CEQA Guidelines describes thresholds for determining significance for environmental topics. CEQA requires identification and mitigation of potentially significant impacts in an EIR; under NEPA, measures are considered to avoid, minimize, or mitigate for all adverse effects of a project, regardless of significance.

As described earlier, the proposed project consists of refinements, modifications, and additions to the approved Transbay Program. When the 2004 FEIS/EIR was adopted, mitigation measures that were recommended to reduce and alleviate potential impacts of the Transbay Program also were adopted and incorporated into the program. Consequently, for this SEIS/EIR, the effects under NEPA and the impact significance under CEQA for the proposed project have been determined assuming that the previously adopted mitigation measures, which are now part of the existing program, would continue to be implemented. Based on this, potential impacts from the proposed project can be categorized into four types (the NEPA effect type is identified first, followed by the CEQA impact type):

- *No Effect/No Impact* – no environmental consequences would occur.
- *No Adverse Effect/Less-than-Significant Impact* – environmental consequences would not be substantial or adverse, or if they would be, they would be significantly reduced with the mitigation measures adopted from the 2004 FEIS/EIR and incorporated into the proposed project.
- *No Adverse Effect/Significant Impact with Mitigation* – environmental consequences would be substantial and adverse but could be significantly reduced with the newly proposed mitigation measures identified in this SEIS/EIR.
- *Adverse Effect/Significant and Unavoidable Impact* – environmental consequences would be substantial and adverse and would remain so even with implementation of the mitigation measures identified in this SEIS/EIR.

The above four NEPA/CEQA effect/impact types are applicable to the vast majority of the effects/impacts analyzed in this SEIS/EIR. However, instances occur in which the CEQA impact type varies from the NEPA effect type, because of differences in how CEQA and NEPA define significance. In addition, occasions exist where implementation of the proposed project may result in an improvement (or lesser impacts), compared to conditions without the proposed project. These *Beneficial* effects are identified in the environmental analysis presented in Chapter 3 of this SEIS/EIR.

New Mitigation Measures to Address Adverse/Significant Effects

Table S-2 at the end of this Summary shows that the proposed project would require new mitigation measures, in addition to those previously adopted and incorporated into the Transbay Program, to address adverse effects/ significant impacts. New mitigation in this SEIS/EIR is identified for the following resource

topics: transportation; historic and cultural resources; biological resources; water resources and water quality; electromagnetic fields; geology, soils, and seismicity; noise and vibration; and air quality. For the specific impacts that would trigger the need to implement mitigation measures and a description of the mitigation measures, see Table S-2.

Table S-2 is a comprehensive compilation of all impacts analyzed in this SEIS/EIR, along with all previously adopted and new mitigation measures. In the first column of Table S-2, a "summary impact statement" is provided to highlight the anticipated effect under NEPA and the significance of the impact under CEQA. Each summary statement is assigned an alphanumeric designation that identifies the resource (e.g., TR for Transportation) and an impact number (e.g., 1, 2, 3). Construction impacts are denoted with a "C" before the resource topic abbreviation (e.g., Impact C-TR-3). Cumulative impacts are denoted with a "CU" before the resource topic abbreviation (e.g., Impact CU-TR-1).

Significant and Unavoidable Effects

As identified in Table S-2, the proposed project would result in the following two adverse effects even after implementation of the recommended mitigation measures:

- Greenhouse gas emissions into the atmosphere have been correlated with climate change. Among the changes that are projected to affect the project area is sea-level rise. At this time, the feasibility of implementing measures necessary to avoid future inundation associated with sea-level rise is not known, and no firm commitment exists to strategies to implement flood protection. Sea-level rise in the year 2100 would be a significant and unavoidable impact under CEQA.

- Construction activities during daytime hours would not result in significant noise impacts. However, nighttime construction could occur, if a waiver is issued by the City to perform such work after normal hours. Receptors are more sensitive during nighttime hours, when ambient noise levels also are less. Therefore, noise from construction at night would be adverse/significant and unavoidable.

S6 ARE THERE ALTERNATIVE WAYS TO ACCOMPLISH THE GOALS OF THE PROPOSED PROJECT?

The proposed project consists of refinements and improvements to the adopted Transbay Program. It does not propose substantive modifications to the Transbay Program, but instead seeks to further achieve and support the purpose and need for the approved program. Therefore, no alternatives exist that would satisfy the purpose, need, and stated objectives of the proposed project. In addition, with implementation of the proposed mitigation measures, two impacts under CEQA would remain significant and unavoidable but would not be substantially reduced by considering an alternative to the proposed project. The TJPA has examined options or variations to implementing individual proposed project components, and these are described in detail in Chapter 2 of this SEIS/EIR.

S7 WHAT HAPPENS IF THE PROPOSED PROJECT IS NOT APPROVED?

If the proposed project were not approved, the previously adopted Transbay Program could still be implemented, because it has the required approvals from local, state, and federal agencies. In other words, if no action was taken on the proposed project, Phase 2 of the Transbay Program would be completed as previously approved. If this were to occur, the program that would be implemented would result in the following conditions:

- It would not comply with the design specifications of the California High-Speed Rail Authority. Extension of the train box would need to be made later to

enable HSR service, when it would be more difficult and impactful to make changes to the throat structure and train box.

- The vent structures/emergency exits would not comply with the current standards issued by the National Fire Protection Association for life safety.

- It would result in a less direct and convenient pedestrian connection between the Transit Center and the BART/Muni station on Market Street.

- It would not support the City's plans for residential or mixed-use development at the proposed intercity bus facility and vent structure location at Third and Townsend Streets, or the City's vision for development at and around the Caltrain railyard.

S8 AREAS OF CONTROVERSY IDENTIFIED IN THE SCOPING PROCESS

In response to the release of the Notice of Preparation, the scoping meeting, and information provided to participating agencies, questions were raised about the proposed project and the previously approved Transbay Program. Some of these topics would be subject to further work during the more advanced engineering stage that would follow; others may continue to be discussed and addressed during the proposed project-merits discussion before the TJPA Board. The chief issues that have been raised are as follows:

- Construction methods and impacts on 235 Second Street and 589 Howard Street because of the widened throat structure that would be beneath both properties;

- Safety and emergency exit plans for the underground three-track extension from the existing Caltrain terminus to the Transit Center;

- The effect of sea-level rise and climate change on the underground transit system;

- The appearance and visual effects of the vent structures; and

- The alignment for the DTX, even though the route was approved previously, and how well it would preserve future opportunities to extend the alignment for an East Bay connection.

S9 WHAT HAPPENS NEXT?

This is a Draft SEIS/EIR and has been distributed by FTA and the TJPA for public review and comment. Copies of this report have been distributed to the following locations and can be reviewed there:

- TJPA, 201 Mission Street, Suite 2100, San Francisco, CA

- San Francisco Main Library, Government Information Center, 100 Larkin St., 5th Floor, San Francisco, CA

- MTC-ABAG Library, Joseph P. Bort MetroCenter, 101 8th Street, Oakland, CA

This report also is available on the TJPA website at: http://transbaycenter.org/tjpa/documents/environmental-documents.

S10 WHAT IF I WANT TO MAKE A COMMENT ON THIS REPORT?

To make comments on this Draft SEIS/EIR, written comments may be submitted to either of the following:

- Brenda Perez, Federal Transit Administration, Region 9, 90 7th Street, Suite 15-300, San Francisco, CA 94103-6701

- Scott Boule, Legislative Affairs and Community Outreach Manager,

Transbay Joint Powers Authority, 201 Mission Street, Suite 2100, San Francisco, CA 94105

E-mail comments also may be submitted to:

brenda.perez@dot.gov, or

SEIS.EIR@transbaycenter.org

Comments may also be provided in person at a meeting on February 10, 2016, at 5 p.m. at 201 Mission Street, Suite 2100. The 60-day period for submitting comments is from December 28, 2015 to February 29, 2016.

FTA and the TJPA will prepare written responses to all comments on environmental issues that are received during the comment period. These responses, along with any changes to the report or to the proposed project as a result of the comments, will be compiled in a Final SEIS/EIR. This final document will be distributed to all federal, state, and local agencies, private organizations, and members of the public who provide substantive comments on the Draft SEIS/EIR or who request a copy of the Final SEIS/EIR.

S11 IF THE ENVIRONMENTAL DOCUMENT IS APPROVED, DOES THAT MEAN THAT THE PROJECT WILL MOVE FORWARD?

The environmental document must be certified or approved before the proposed project can be approved. However, approval of the environmental document does not mean that the proposed project is approved and would be constructed.

For CEQA, the TJPA must certify that the Final SEIS/EIR has been completed in compliance with CEQA and the State CEQA Guidelines. This certification along with "findings" for each significant environmental impact in the Final SEIS/EIR must be completed before the TJPA can take action to advance the proposed project. Certification of the Final SEIS/EIR would occur during a public hearing before the TJPA Board. This "environmental clearance" step is necessary before the proposed project could be approved. The TJPA must prepare and file a *Notice of Determination* to report its approval of the proposed project.

FTA has a three-phase process for funding potential projects through its Capital Investment Program: Project Development, Engineering, and Full Funding Grant Agreement. The environmental review process, pursuant to NEPA, is completed during or before the initial Project Development phase. FTA must review the Final SEIS/EIR and approve it for public release through a Notice of Availability in the Federal Register.

The *Record of Decision (ROD)* will present FTA's basis for its decision on the project and it will also include a description of the project, alternatives evaluated, summary of environmental findings, and mitigation measures approved for the project. FTA would consider any comments in rendering its decision on the proposed project and then would issue the ROD describing the findings of the SEIS/EIR and the rationale for its decision. FTA may issue a single Final SEIS/EIR and ROD document, pursuant to Public Law 112-141, 126 Stat. 405, Section 1319, unless FTA determines that statutory criteria or practicability considerations preclude issuance of the combined document, pursuant to Section 1319. If FTA could not issue a joint Final SEIS/ROD document, then FTA may amend its previous ROD instead of issuing a new ROD.

With completion of the federal environmental review processes, implementation of the proposed project would depend on project readiness and the availability of funding. These aspects of the proposed project would be evaluated closely by FTA, before allowing the TJPA to enter the Engineering phase. The TJPA would need to provide sufficient information for FTA to evaluate and rate the proposed project against statutory project justification and local financial commitment criteria.

On completion of the Engineering phase, FTA would consider a Full Funding Grant Agreement with the TJPA, provided that the project's design, scope, cost, schedule, and benefits are firm and final; other funding sources are

committed; third-party agreements are completed; and the management approach is sufficient to construct and implement the project.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
3.2 Transportation				
TR-1: The proposed project would not result in levels of service that would exceed the City's threshold for acceptable operations or result in localized circulation and access effects.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	*New-MM-TR-1.1 Modify Signal Operations at the 16th Street Intersection with the Caltrain tracks and Owens Street.* During final design, and after the location of the crossing gates for the turnback track along 16th Street has been determined, the TJPA shall conduct further traffic analysis of the turnback and maintenance of way tracks to evaluate traffic, pedestrian, and bicycle operations along 16th Street at Seventh Street, the Caltrain/turnback tracks, and Owen Street. Changes to the PCEP OCS and specialty trackwork, such as control points, switches, and train signals, will be undertaken by the TJPA to allow Caltrain to continue its operations at the level of service defined in the PCEP EIR. In addition, if the traffic analysis shows that the intersections along 16th Street do not meet the City's service levels for automobile traffic and pedestrian and bicycle circulation, the TJPA will coordinate with the City and will be responsible for implementing changes at these crossings to satisfy the City's LOS signalized intersection standards for impacts caused by turnback track operations for DTX; provide sufficient crossing time for pedestrians and bicyclists; and avoid creation of potentially hazardous conditions for pedestrians and bicyclists.	No Adverse Effect/ Less-than-Significant Impact
TR-2: The proposed project would not result in substantial increases to transit demand resulting in unacceptable levels of transit service, or cause a substantial increase in delays or operating costs.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
TR-3: The proposed project would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or interfere with pedestrian accessibility to the site and adjoining areas.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	Ped 1 – use future construction or redevelopment as opportunities to increase building set-backs, thereby increasing sidewalk widths. Ped 2 – eliminate or reduce sidewalk street furniture in the immediate Transbay Terminal area on corners. Ped 3 – re-time traffic light signalization to pedestrian levels of service at each of the intersections studies that fall into LOS F. Ped 4 – provide crosswalk signalization at intersections where they do not exist already. Ped 5 – provide crosswalk count-down signals at intersections and crosswalks immediately surrounding the new Transbay Terminal. Ped 6 – ensure that Transbay Terminal design increases corner and sidewalk widths at the four intersections immediately surrounding the Transbay Terminal. Ped 7 – provide lights within crosswalks to warn when pedestrians are present in the crosswalk.	See *New-MM-TR-1.1*	No Adverse Effect/ Less-than-Significant Impact
TR-4: The proposed project would not be expected to substantially interfere with bicycle accessibility to the site and adjoining areas.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	See *New-MM-TR-1.1*	No Adverse Effect/ Less-than-Significant Impact
TR-5: The proposed project would not result in a parking or loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site facilities or within convenient designated on-street areas.	No Adverse Effect for parking and No Adverse Effect/Less-than-Significant Impact for loading	None.	None required.	Not applicable.
TR-6: The proposed project would not result in inadequate emergency access.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
C-TR-7: The proposed project would result in temporary impacts on the surrounding transportation network as a result of construction activity, but these impacts would be reduced by previously approved measures incorporated into the project, City requirements, and the DTX Design Criteria, which call for preparation of a plan for maintenance and protection of traffic.	No Adverse Effect/ Less-than-Significant Impact	PC 2 – interview businesses along the alignment to assist in (a) the identification of possible techniques during construction to maintain critical business activities, (b) analyze alternative access routes for customers and deliveries to businesses, (c) develop traffic control and detour plans, and (d) finalize construction practices. PC 4 – establish community construction information/outreach program to provide ongoing dialogue construction impacts and possible mitigation/solutions. PC 5 – establish site and field offices located along the alignment to better understand	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
		community/business needs during the construction period; manage construction-related matters pertaining to the public; and notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks). PC 6 – implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction, and to provide information on the project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information. PC 7 – develop traffic management plans to maintain access to all businesses. Perform daily cleaning of work areas for the duration of the construction period. Include provisions in construction contracts to require maintenance of driveway access to businesses to the extent feasible. GC 1 – disseminate information to the community in a timely manner regarding anticipated construction activities. GC 2 – provide signage and work with establishments affected by construction activities to develop appropriate signage for alternate routes. GC 3 – install level decking at the cut-and-cover sections to be flush with the existing street or sidewalk levels. GC 4 – provide for efficient sidewalk design and maintenance. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), restore it to its original width during the majority of construction period.		
CU-TR-8: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on traffic.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-TR-9: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on Caltrain facilities, systems, or operations.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.3 Land Use and Planning, Wind, and Shadow				
LU-1: The proposed project would not physically divide an established community.	No Effect/No Impact	None.	None required.	Not applicable.
LU-2: The proposed project would not conflict with any applicable land use plan, policy, or regulation by the City adopted for the purpose of avoiding or mitigating an environmental effect.	No Effect/No Impact	None.	None required.	Not applicable.
LU-3: The proposed project would be compatible with nearby existing land uses and neighborhood character.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
LU-4: The proposed project would not create a new shadow in a manner that would substantially affect the use of any park or open space under the jurisdiction of the San Francisco Recreation and Park Department, publicly accessible open space, outdoor recreation facility, or other public area.	No Effect/No Impact	None.	None required.	Not applicable.
CU-LU-5: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative land use impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
3.4 Socioeconomics, Population, and Housing				
SE-1: The proposed project would not displace homes. Displaced businesses would have adequate replacement resources in the project area.	No Adverse Effect/ Less-than-Significant Impact	Prop 1 – to mitigate for land acquisition and displacement, all homeowners, renters, and businesses shall be offered relocation assistance in accordance with state and federal laws.	None required.	Not applicable.
SE-2: The proposed project would not result in changes to City government operation due to substantial alteration of fiscal conditions.	No Effect/No Impact	None.	None required.	Not applicable.
SE-3: The proposed project would not result in substantial loss of community cohesion, social patterns of interaction, or important social or cultural institutions.	No Effect/No Impact	None.	None required.	Not applicable.
SE-4: The proposed project would not result in adverse impacts on transit dependent populations, including people with disabilities, children, the elderly, and households without a vehicle, or on low English language proficiency populations.	Beneficial Effect/No Impact	PC 6 – implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction, and to provide information on the project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information.	None required.	Not applicable.
SE-5: The proposed project would not disproportionately affect children.	No Adverse Effect with Mitigation/ analysis not required explicitly under CEQA	See the following: *Saf 1 though Saf 3* *NoiO 1 through NoiO 3* *NoiC 1 through NoiC 6* *VibO 1* *VibC 1 through VibC 6* *SG 1* *HWO 1 through HWO 7* *HMC 1 through HMC 7, HMC 9, and HMC 10* *Ped 1 through Ped 7* *PC 4 through PC 7* *GC 1 through GC 5* *AC 1 through AC 15*	*New-MM-TR-1.1* *New-MM-WQ-4.1* *New-MM-CU-WQ-9.1* *New-MM-NO-1.1* *New-MM-AQ-3.1* *New-MM-AQ-3.2* *New-MM-C-AQ-5.1*	No Adverse Effect
C-SE-6: The proposed project would not result in significant temporary socioeconomic impacts associated with construction of the proposed project.	No Adverse Effect/ Less-than-Significant Impact	PC 2 – interview businesses along the alignment to assist in (a) the identification of possible techniques during construction to maintain critical business activities, (b) analyze alternative access routes for customers and deliveries to businesses, (c) develop traffic control and detour plans, and (d) finalize construction practices. PC 4 – establish community construction information/outreach program to provide ongoing dialogue construction impacts and possible mitigation/solutions. PC 5 – establish site and field offices located along the alignment to better understand community/business needs during the construction period; manage construction-related matters pertaining to the public; and notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks). PC 6 – implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction, and to provide information on the project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information. PC 7 – develop traffic management plans to maintain access to all businesses. Perform daily cleaning of work areas for the duration of the construction period. Include provisions in construction contracts to require maintenance of driveway access to businesses to the extent feasible. GC 1 – disseminate information to the community in a timely manner regarding anticipated construction activities. GC 2 – provide signage and work with establishments affected by construction activities to develop appropriate signage for alternate routes.	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
CU-SE-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative socioeconomics impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.5 Visual Quality/Aesthetics				
VQ-1: The proposed project would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
VQ-2: The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings.	No Adverse Effect/ Less-than-Significant Impact	VA 2 – make all efforts to minimize specific aesthetic and visual effects of construction identified by users of neighborhood businesses and residents.	None required.	Not applicable.
VQ-3: The proposed project could create a new source of substantial light or glare, but it would not adversely affect day or nighttime views in the area.	No Adverse Effect/ Less-than-Significant Impact	VA 1 – direct artificial lighting onto the work site at night to minimize “spill over” light or glare effects.	None required.	Not applicable.
CU-VQ-4: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on aesthetics or visual quality.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-VQ-5: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative light and glare impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.6 Historic and Cultural Resources				
CR-1: The proposed project could cause a substantial adverse change in the significance of archaeological resources pursuant to Section 15064.5 of the CEQA Guidelines, but this potential effect would be avoided with modifications to the previously adopted mitigation measures for the Transbay Program.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	CH 15 – consult with FTA, SHPO, the Joint Powers Board, and the City within 45 days of MOA execution to initiate the process of determining how archaeological properties that may be affected by the project will be identified, how NRHP eligibility will be addressed, and how effects to archaeological properties will be taken into account. CH 16 – prepare a treatment plan if the consulting parties agree that one is necessary. CH 17 – prepare a draft technical report documenting the results of treatment plan implementation, if one was required, within two years of completion and in consultation with FTA. CH 18 – if a treatment plan will not be prepared, address any archaeological properties discovered during implementation. CH 19 – ensure that all actions and documentation are consistent with Section 304 of the NRHP and Section 6254.10 of the California Government Code. CH 20 – agree that Native American burials and related items discovered during project implementation will be treated in accordance with the requirements of Section 7050.5(b) of the California Health and Safety Code.	CH 16 amended, to create an updated DURF ARDTP.	No Adverse Effect/ Less-than-Significant Impact
CR-2: The proposed project could cause direct adverse impacts on historic architectural resources, but this potential effect would be avoided with modifications to the previously adopted mitigation measures for the Transbay Program.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	CH 11 – in consultation with property owners, develop and implement measures to protect contributing elements of historic properties. CH 12 – determine the level and type of recordation necessary prior to adversely affecting historic properties. CH 13 – repair any project-related damage (in accordance with the Secretary of the Interior’s standards) to contributing elements of the Second and Howard Streets Historic District, the Rincon Point/South Beach Historic Warehouse Industrial District, 589 Howard Street.	CH 12 amended, to also include the 180 Townsend Street location and remove 165-173 Second Street. CH 13 amended, to also include the 589 Howard Street location and the 165-173 Second Street location.	No Adverse Effect/ Less-than-Significant Impact
C-CR-3: Construction activities for the proposed project would not result in a substantial adverse change in the significance of a historical resource.	No Effect/No Impact	None.	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
C-CR-4: The proposed project could result in damage or destruction of previously unknown unique paleontological resources during construction-related activities, but this potential effect would be avoided by proposed preconstruction mitigation.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None; 2004 FEIS/EIR did not evaluate potential paleontological resources.	*New-MM-C-CR-4.1 Minimize Potential Impacts to Paleontological Resources.* To minimize potential adverse impacts on previously unknown, potentially unique, scientifically important paleontological resources, the TJPA shall do the following: • Before the start of any earthmoving activities, the TJPA shall retain a qualified paleontologist to train all construction personnel involved with earthmoving activities, including the project superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and the proper notification procedures should be followed if fossils are encountered. • The construction crew shall immediately cease ground-disturbing work in the vicinity of the find and notify the TJPA. • The TJPA shall retain a qualified paleontologist to evaluate the resource and prepare a recovery plan, in accordance with Society of Vertebrate Paleontology guidelines (SVP 1996). The recovery plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Necessary and feasible recommendations in the recovery plan shall be implemented before construction activities are resumed at the site where the paleontological resource was discovered.	No Adverse Effect/ Less-than-Significant Impact
CU-CR-5: The proposed project in combination with other past, present, and reasonably foreseeable development would not result in adverse cumulative effects on archaeological resources.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-CR-6: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on historical resources.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-CR-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on paleontological resources.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	See *New-MM-C-CR-4.1*	No Adverse Effect/ Less-than-Significant Impact
3.7 Biological Resources				
C-BR-1: The proposed project has the potential to disturb nesting birds when buildings/structures with potential nesting habitat would be disturbed as part of an individual project component and/or during removal of trees and shrubs during project construction, but this potential effect would be avoided by proposed preconstruction mitigation.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None; 2004 FEIS/EIR did not evaluate migratory birds.	*New-MM-C-BR-1. Require Pre-Construction Bird Surveys.* Pre-construction bird surveys shall be required when trees or buildings and/or structures with potential nesting habitat would be disturbed as part of an individual project component. Pre-construction bird surveys shall be conducted on affected potential nesting habitat by a qualified biologist during the nesting season (February 1 through August 15) if construction activities are scheduled to take place during that period. Surveys shall be performed not more than 2 weeks prior to construction in an affected area. If special-status bird or migratory bird species are not found, work may proceed and no further mitigation action is required. If special-status bird or migratory bird species are found to be nesting in or near any work area (at a distance to be determined by a qualified biologist) or, for compliance with federal and state law concerning migratory birds, if birds protected under the federal MBTA or the California Fish and Game Code are found to be nesting in or near any work area, an appropriate no-work buffer zone (e.g., 100 feet for songbirds, 250 feet for raptors) shall be designated by the biologist. Depending on the species involved, the qualified biologist may require input from CDFW and/or the USFWS Division of Migratory Bird Management regarding the most appropriate ways to avoid disturbance to nesting birds. As recommended by the biologist, no activities shall be conducted within the no-work buffer zone that could harass birds or disrupt bird nesting. Outside of the nesting season (August 16 through January 31), or after young birds have fledged, as determined by the biologist, work activities may proceed. Birds that establish nests during the construction period are considered habituated to such activity, and no buffer shall be required, except as needed to avoid direct destruction of the nest, which shall be prohibited.	No Adverse Effect/ Less-than-Significant Impact

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
CU-BR-2: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on biological resources.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	See *New-MM-C-BR-1.1*	No Adverse Effect/ Less-than-Significant Impact
3.8 Water Resources and Water Quality				
WQ-1: The proposed project would not violate water quality standards or waste discharge requirements.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
WQ-2: The proposed project would not substantially deplete groundwater supplies or interfere with groundwater recharge.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
WQ-3: The proposed project would not substantially alter drainage patterns in the project area or create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
WQ-4: The proposed project would not expose life or structures to substantial flood hazards or flooding.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	*New-MM-WQ-4.1 Modify DTX Design Criteria to Avoid Flood Hazards.* The TJPA shall modify the DTX Design Criteria to protect project elements from the EO 13690–defined flood hazard. Specifically, the TJPA shall design and construct Transbay Program Phase 2 within the area delineated as being within a floodplain, as defined as the 100-year flood elevation plus 2 feet consistent with EO 11988, as amended by EO 13690, to prevent inundation of the project rail alignment and associated infrastructure and to remain operational for the predicted flood level. Changes to the current DTX Design Criteria will include designing station entrances and other points of access to below-ground portions of the DTX system, to maintain the required 2 feet of freeboard above the 100-year base flood elevation. Changes to the design criteria will be completed prior to the next phase of design so that these new standards can be incorporated in the design of the next phase. The performance standard to be achieved will protect the proposed project from flood hazards as defined in EO 13690. In updating project designs to meet the modified DTX Design Criteria, the TJPA shall consider the cost-benefit of flood-proofing measures and designs that do not preclude other measures that may be more practicable and effective when the future flood risks become more evident. Because implementation of the proposed project would occur at a future date, the TJPA shall amend and update the DTX Design Criteria to incorporate new information related to San Francisco's FEMA FIRM or climate-informed science predictions and mapping of sea-level rise.	No Adverse Effect/ Less-than-Significant Impact
WQ-5: The proposed project would not place housing within a 100-year flood hazard area.	No Effect/Less-than-Significant Impact	None.	None required.	Not applicable.
C-WQ-6: The proposed project would not violate water quality standards or waste discharge requirements during construction.	No Adverse Effect/ Less-than-Significant Impact	HMC 2 – prior to construction, investigate the potential presence of contaminants in soil and groundwater. Based on the chemical test results, develop a mitigation plan that follows the requirements of Article 22A. HMC 3 – cover soils removed during excavation and grading to prevent fugitive dust. HMC 4 – use a licensed waste hauler to dispose of soil at a landfill or recycling facility. HMC 5 – use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works, and if contamination occurs, apply appropriate treatment. HMC 6 – prior to starting project construction, develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater. HMC 7 – design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions.	None required.	Not applicable.
CU-WQ-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative water quality impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
CU-WQ-8: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative flood hazard impacts.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	See *New-MM-WQ-4.1*	No Adverse Effect/ Less-than-Significant Impact
CU-WQ-9: Sea-level rise due to climate change is not projected to inundate portions of the project area in 2050, but would inundate portions of the project area by 2100.	Effect determination not required under NEPA/Significant and Unavoidable	None; 2004 FEIS/EIR did not evaluate sea-level rise.	*New-MM-CU-WQ-9.1 Prepare a Sea-Level Rise Adaptation Plan.* Based on the vulnerabilities identified from inundation maps of year 2100 sea-level rise, the TJPA will prepare a Sea-Level Rise Adaptation Plan identifying measures that will be taken to protect the new project facilities as well as the existing TJPA facilities from potential damage due to future flooding from sea-level rise. The TJPA will coordinate with other entities with facilities close to the San Francisco Bay with an equal or greater sea-level rise vulnerability, such as local jurisdictions (e.g., City and County of San Francisco), agencies (e.g., San Francisco Bay Conservation and Development Commission, the Port of San Francisco, BART, the California Department of Transportation, and the San Francisco Municipal Transportation Agency). Specifically, the TJPA designs its infrastructure system and buildings so that they remain resilient and adaptable over time. The strategies to implement such protection will evolve from the ongoing sessions with other local jurisdictions and agencies, and the performance standard to be achieved will protect the proposed project from the sea-level rise depths as projected by the City for the year 2100. It is recognized that the flood depths may be refined over time and that new regional and citywide strategies to address sea-level rise will be identified. To the extent feasible, the TJPA shall amend and update its Adaptation Plan and the performance standard to incorporate this new information. The TJPA shall complete the first Sea-Level Rise Adaptation Plan as part of DTX final design. The Plan shall include the following: a. Review of available scientific information on sea-level rise data and projections for the subsequent 50 years. Where data and projections indicate different rates of sea-level rise than previously applied, the TJPA will adjust the proposed project's vulnerability assessment and flood design criteria to reflect a median-point of then-current projections. b. Improvements will meet the flood design criteria as feasible and unconstrained by surrounding development not owned by the TJPA. c. The plan may also rely on flood improvements implemented separate from the TJPA but that will also provide flooding benefits for Transbay Program Phase 2 facilities. d. Opportunities for partnership with other local and regional parties for sea-level rise adaptation or where regional efforts will address flooding risks to TJPA facilities. f. Consideration of the cost-benefit of flood-proofing measures and designs that do not preclude other measures that may be more practicable and effective when the future flood risks become more evident. Where the TJPA's adaptation options are constrained because of adjacent infrastructure (such as adjacent roadways and structures not owned by the TJPA), the TJPA will work with adjacent landowners and infrastructure managers to identify opportunities to improve rail system protection in concert with other local or regional parties. See *New-MM-WQ-4.1*	No Adverse Effect/ Less-than-Significant Impact with sea-level rise projections to 2050; Significant and Unavoidable with sea-level rise projections to 2100 under CEQA only

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
3.9 Geology, Soils, and Seismicity				
GE-1: The proposed project would not expose people or structures to strong seismic groundshaking during a major earthquake.	No Adverse Effect/ Less-than-Significant Impact	SG 2 – apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels. SG 3 – design and construct structural components to resist strong ground motions approximating the defined maximum anticipated earthquake.	None required.	Not applicable.
GE-2: The proposed project would not expose people or structures to seismic-related ground failure, including liquefaction.	No Adverse Effect/ Less-than-Significant Impact	SG 2 – apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels. SG 3 – design and construct structural components to resist strong ground motions approximating the defined maximum anticipated earthquake. SG 5 – design and construct pile-supported foundations to minimize non-seismic settlement in areas susceptible to potential settlement.	None required; however, the following improvement measure is offered to supplement the previously adopted measures: *New-I-GE-2.1 Augment DTX Design Criteria at the Extended Train Box, Transit Center Vent Structures, and any Above-Ground Structure or Facility.* The TJPA shall require the consideration of the following additional measures to reduce the risk of ground failure. The inclusion of these techniques shall be evaluated by the TJPA on a case-by-case basis, considering soil and ground conditions, overhead clearances, subsurface impediments, schedule effects, cost efficiencies, and other factors that the TJPA may deem important. • Vibro-replacement stone columns: A vibrator could be used to penetrate to the required depth by means of its weight, and vibrations and horizontal vibrations are generated at treatment depth with the use of eccentric weights that are rotated by electric motors; this is effective in reducing the liquefaction potential of sands and low-plasticity silt. • Deep soil mixing: Soil is blended with cementitious and/or other reagent materials through the tips of the auger during auger penetration and removal to form continuous soil-cement columns. • Grouting techniques (compaction, permeation, deep mixing, chemical, and jet grouting).	Not applicable.
GE-3: The proposed project would be located on expansive soils; however, compliance with design standards and performance specifications would reduce risks to life and property.	No Adverse Effect/ Less-than-Significant Impact	None.	None required; however, the following improvement measure is offered to supplement the previously adopted measures: *New-I-GE-3.1 Addressing Expansive Soils at the Vent Structure at Second and Harrison Streets and the AC Transit Bus Storage Facility Parking Sites.* The TJPA shall require the consideration of the following additional measures to address expansive soils. The inclusion of these techniques shall be evaluated by the TJPA on a case-by-case basis, considering soil and ground conditions, schedule effects, cost efficiencies, and other factors that the TJPA may deem important. • Replace expansive soils with non-expansive soils: Expansive soils can be excavated and replaced with non-expansive materials. • Treat expansive soils: Expansive soils may be treated in place by mixing them with lime or cement. Lime treatment alters the chemical composition of the expansive clay minerals such that the soil becomes non-expansive. Cement treatment also alters the chemical composition of the expansive clay minerals such that the soil becomes non-expansive by forming a lean cement mixture beneath the pavement base.	Not applicable.
C-GE-4: During excavation, the proposed project could cause settlement for adjacent properties and create hazards for construction workers and the public, but this potential effect would be reduced by proposed mitigation to address changes to groundwater level.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	SG 1 – monitor adjacent buildings for movement and, if movement is detected, immediate actions to control the movement would be needed. SG 2 – apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels. SG 4 – underpin existing buildings to protect the structures from potential damage that could result from excessive ground movements during construction. SG 5 – design and construct pile-supported foundations to minimize non-seismic settlement in areas susceptible to potential settlement.	*New-MM-C-GE-4.1 Dewatering at the Extended Train Box and Transit Center Vent Structures Sites.* Groundwater level shall be maintained a minimum of 2 feet or more beneath the bottom of the excavation throughout construction to minimize the potential of base failure due to high seepage gradients.	No Adverse Effect/ Less-than-Significant Impact

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
C-GE-5: The proposed project would not result in substantial soil erosion or the loss of topsoil.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-GE-6: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on geology and seismicity.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.10 Hazardous Materials				
HZ-1: The proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or wastes, or through the accidental release of such materials.	No Adverse Effect/ Less-than-Significant Impact	HWO 1 – construct and operate any fueling facility in compliance with local, state, and federal regulations regarding handling and storage of hazardous materials. HWO 2 – equip diesel fuel pumps with emergency shut-off valves and, in compliance with U.S. EPA requirements; equip fuel Underground Storage Tanks (USTs) with leak detection and monitoring systems. HWO 3 – employ secondary containment systems for any aboveground storage tanks. HWO 4 – store cleaning solvents in 55-gallon drums, or other appropriate containers, within a bermed area to provide secondary containment. HWO 5 – slope paved surfaces within the fueling facility and the solvent storage area to a sump where any spilled liquids could be recovered for proper disposal. HWO 6 – follow California OSHA and local standards for fire protection and prevention for the handling and storage of fuels and solvents. HWO 7 – prepare a Hazardous Materials Management/ Business Plan and file with the SFDPH.	None required.	Not applicable.
HZ-2: The proposed project would not create a significant long-term operational hazard to the public or the environment through exposure to existing hazardous materials contamination.	No Adverse Effect/ Less-than-Significant Impact	HMC 2 – TJPA shall perform detailed investigations of the potential presence of contaminants in soil and groundwater prior to construction, using conventional drilling, sampling, and chemical testing methods. HMC 5 – TJPA shall use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works as well as to evaluate requirements for pretreatment prior to discharge to the sanitary sewer. HMC 6 – TJPA shall develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater prior to starting project construction. HMC 7 – TJPA shall design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions. HMC 8 – TJPA shall require that workers performing activities on site that may involve contact with contaminated soil or groundwater have appropriate health and safety training in accordance with 29 CFR 1910.120.	None required.	Not applicable.
HZ-3: The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
C-HZ-4: Ground-disturbing and excavation activities associated with construction of the proposed project would not expose construction workers, the public, or the environment to known hazardous materials sites.	No Adverse Effect/ Less-than-Significant Impact	HMC 1 – TJPA shall follow California OSHA and local standards for fire protection and prevention. Handling and storage of fuels and other flammable materials during construction will conform to these requirements, which include appropriate storage of flammable liquids and prohibition of open flames within 50 feet of flammable storage areas. HMC 2 – TJPA shall perform detailed investigations of the potential presence of contaminants in soil and groundwater prior to construction, using conventional drilling, sampling, and chemical testing methods. HMC 3 – TJPA shall cover with plastic sheeting soils removed during excavation and grading activities that remain at a centralized location for an extended period of time to	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
		prevent the generation of fugitive dust emissions that migrate off-site. HMC 4 – TJPA shall use a licensed waste hauler, applying appropriate manifests or bill of lading procedures, as required to haul soil for disposal at a landfill or recycling facility. HMC 5 – TJPA shall use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works as well as to evaluate requirements for pretreatment prior to discharge to the sanitary sewer. HMC 6 – TJPA shall develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater prior to starting project construction. HMC 7 – TJPA shall design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions. HMC 8 – TJPA shall require that workers performing activities on site that may involve contact with contaminated soil or groundwater have appropriate health and safety training in accordance with 29 CFR 1910.120.		
C-HZ-5: Demolition or construction activities associated with the proposed project could expose construction workers, the public, or the environment to known hazardous materials sites, including possible asbestos-containing materials and lead-based paints, but this potential effect would be mitigated by previously adopted mitigation measures and compliance with existing regulations.	No Adverse Effect/ Less-than-Significant Impact	HMC 9 – TJPA shall review existing asbestos surveys, abatement reports, and supplemental asbestos surveys, as warranted. Perform an asbestos survey for buildings to be demolished, as required. Asbestos-containing building materials (ACM) will require abatement prior to building demolition. Removal and disposal of ACM will be performed in accordance with applicable local, state, and federal regulations. HMC 10 – TJPA shall perform a lead-based paint survey for buildings to be demolished to determine areas where lead-based paint is present and the possible need for abatement prior to demolition.	None required.	Not applicable.
C-HZ-6: Construction activities and equipment associated with the proposed project would not result in exposure of construction workers, the public, or the environment to accidental release of hazardous materials.	No Adverse Effect/ Less-than-Significant Impact	See *HMC 1 through HMC 8*	None required.	Not applicable.
CU-HZ-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative hazardous materials impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.11 Electromagnetic Fields				
EF-1: The proposed project would introduce new sources of EMF generation and exposure, but would not result in health risks or EMI impacts.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	*New-MM-EF-1.1 Evaluate EMI Effects on Nearby Medical Facilities during Final Design of the Additional Trackwork South of the Caltrain Railyard.* During final design, the TJPA shall conduct a site-specific electromagnetic interference (EMI) analysis, based on the OCS alignment, to determine the extent, if any, of disturbance to sensitive electric equipment from the addition of the turnback track, which would be aligned closer to medical and research facilities, such as the University of California San Francisco campus on the east side of the Caltrain right-of-way. If EMI levels result in disturbance to sensitive electric equipment, the TJPA will be responsible for costs related to evaluate, design, monitor, and remediate project-related EMI disruption. More specifically, the following steps will be followed as part of this mitigation measure: • During final design, the TJPA shall evaluate the specific EMI levels associated with the turnback track at the identified sensitive facilities and determine the appropriate controls necessary to avoid disruption of sensitive equipment prior to testing and commissioning of the proposed project. • During the testing and commissioning period for the proposed project, EMI levels shall be measured and the TJPA shall coordinate with the identified sensitive facilities to evaluate whether substantial EMI effects are occurring due to system operations. Where substantial EMI effects are detected that disrupt operations of the sensitive electric equipment, the TJPA shall remedy the disruption prior to commissioning of electrified operations through EMF	No Adverse Effect/ Less-than-Significant Impact

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
			controls and/or shall provide shielding of the sensitive equipment. • After commissioning of the proposed project, EMI levels shall be monitored during the first year of project operation and reporting of the results shall be shared with any of identified sensitive facilities. Identified disruption of sensitive electric equipment during this period shall be immediately remedied through additional modifications to EMF-generating equipment along the turnback track and/or additional shielding of the sensitive electric equipment. EMI can be reduced at the project level through designs that minimize arcing and radiation of radiofrequency energy. Additional mitigation by shielding of sources is not always practical, but susceptibility to EMI can be reduced by choosing devices designed for a high degree of electromagnetic compatibility. The following strategies will be considered, as appropriate by the TJPA, in identifying feasible and effective mitigation for nearby medical electronic equipment: • passive engineering controls (e.g., shielding with metallic materials at the medical facility where excessive EMI levels are projected); • partial cancellation of magnetic field with a wire loop, in which an induced current creates a magnetic field of opposite direction; • active shielding, that requires a power supply and feedback loop to control the induced current and magnetic field direction and magnitude; and • design modifications to place EMF from the OCS further away or higher up.	
CU-EF-2: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative EMF or EMI impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.12 Noise and Vibration				
NO-1: The proposed project would not generate operational noise impacts after implementation of proposed mitigation to reduce noise from vent structures near residential uses.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	NoiO 1 – apply noise mitigation at the following locations adjacent to the bus storage facility: • Provide sound insulation to mitigate noise impacts at the residences north of the AC Transit facility at the corner of Perry and Third Streets. • Construct noise barriers to mitigate noise impacts to residences south of the AC Transit facility along Stillman Street. • Construct a noise barrier to mitigate noise impacts to residences south of the Golden Gate Transit facility along Stillman Street. NoiO 2 – landscape the noise walls. NoiO 3 – construct noise walls prior to the development of the permanent bus facilities.	*New-MM-NO-1.1 Design Ventilation Shaft to Avoid Noise Effects on Nearby Uses.* Ventilation shafts shall be designed in accordance with the APTA guidance for controlling noise, which includes a 60 dBA noise level at 50 feet from the facility, at the setback line of the nearest building, or at the nearest occupied area, whichever is nearest to the source. Treatments may include applying acoustical absorption materials to shaft surfaces or attaching silencers to fans.	No Adverse Effect/ Less-than-Significant Impact
NO-2: The proposed project would not generate operational vibration impacts.	No Adverse Effect/ Less-than-Significant Impact	VibO 1 – use high-resilience track fasteners or a resiliently supported tie system for the Caltrain Downtown Extension for areas projected to exceed vibration criteria, including the following locations: (1) Live/Work Condos, 388 Townsend Street (Hubbell and Seventh), (2) San Francisco Residences on Bryant (Harrison parking lot site), (3) Clock Tower Building and Second Street High Rise, and (4) new Marriott Courtyard (Marine Firefighter's Union).	None required.	Not applicable.
C-NO-3: The proposed project could result in construction noise impacts, if a waiver is issued by the City that would permit nighttime construction to occur.	Adverse Effect/ Significant and Unavoidable Impact	NoiC 1 – comply with the San Francisco noise ordinance. The noise ordinance includes specific limits on noise from construction. The basic requirements are as follows: • Maximum noise level from any piece of powered construction equipment is limited to 80 dBA at 100 feet. • Impact tools are exempted, although such equipment must be equipped with effective mufflers and shields. • Construction activity is prohibited between 8 p.m. and 7 a.m. if it causes noise that exceeds the ambient noise plus 5 dBA.	No additional feasible measures.	Adverse Effect/ Significant and Unavoidable Impact

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
		NoiC 2 – conduct noise monitoring to ensure that contractors take all reasonable steps to minimize noise. NoiC 3 – conduct inspections and noise testing of equipment to ensure that all equipment on the site is in good condition and effectively muffled. NoiC 4 – implement an active community liaison program to keep residents informed about construction plans so that they can plan around periods of particularly high noise levels, and to provide a conduit for residents to express complaints about noise. NoiC 5 – minimize use of vehicle backup alarms. NoiC 6 – include noise control requirements in construction specifications. These should require the contractor to do the following: • Perform all construction in a manner to minimize noise. • Use equipment with effective mufflers. • Perform construction in a manner to maintain noise levels at noise-sensitive land uses below specific limits. • Perform noise monitoring to demonstrate compliance with the noise limits. Independent noise monitoring shall be performed to check compliance in particularly sensitive areas. • Minimize construction activities during evening, nighttime, weekend, and holiday periods. Permits shall be required before construction can be performed in noise-sensitive areas during these periods. • Select haul routes that minimize intrusion to residential areas. • Controlling noise in contractor work areas during nighttime hours is likely to require some mixture of the following approaches: - Restrictions on noise-producing activities during nighttime hours. - Laying out the site to keep noise-producing activities as far as possible from residences, minimizing the use of backup alarms, and minimizing truck activity and truck queuing near the residential areas. - Using procedures and equipment that produce lower noise levels than normal. - Using temporary barriers near noisy activities. - Using partial enclosures around noisy activities.		
C-NO-4: The proposed project could result in construction vibration impacts, but this potential effect would be avoided by proposed preconstruction mitigation.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	VibC 1 – limit or prohibit use of construction techniques that create high vibration levels. At a minimum, processes such as pile driving shall be prohibited at distances less than 250 feet from residences. VibC 2 – restrict procedures that contractors can use in vibration-sensitive areas. VibC 3 – require vibration monitoring during vibration-intensive activities. VibC 4 – restrict the hours of vibration-intensive activities such as pile driving to weekdays during daytime hours. VibC 5 – investigate alternative construction methods and practices to reduce impacts in coordination with the construction contractor if resident annoyance from vibration becomes a problem. VibC 6 – include specific limits, practices, and monitoring and reporting procedures for the use of controlled detonation. Control and monitor use of controlled detonation to avoid damage to existing structures. Include specific limits, practices, and monitoring and reporting procedures within contract documents to ensure that such construction methods, if used, would not exceed safety criteria.	*New-MM-C-NO-4.1 Protect 589 Howard Street and 171 Second Street Historic Buildings from Construction Impacts.* Prior to commencement of construction activity, a qualified structural engineer licensed in California with demonstrated experience with historic buildings and the application of the Secretary of the Interior's Standards for the Treatment of Historic Properties shall survey the existing foundation and other structural aspects of the 589 Howard Street and 171 Second buildings (subject to property owner granting access to conduct the survey). The qualified structural engineer shall submit a pre-construction survey letter establishing baseline conditions at each of the historic buildings. These baseline conditions shall be forwarded to the TJPA and to the mitigation monitor prior to issuance of any building permits. The survey shall also provide a shoring design to protect the structural integrity of the buildings at 589 Howard Street and 171 Second Street from potential damage. At the conclusion of vibration-causing activities, the qualified structural engineer shall conduct a comprehensive survey of the buildings to assess post-construction conditions and issue a follow-up letter describing structural or cosmetic damage, if any, to the historic buildings. The letter shall include recommendations for any repair, as may be necessary, in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Repairs shall be undertaken and completed in conformance with all applicable codes, including the California Historical Building Code (Part 8 of Title 24).	No Adverse Effect/ Less-than-Significant Impact

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
CU-NO-5: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative noise or vibration impacts.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	See the following: *NoiO 1 through 3* *VibO 1* *NoiC 1 through 6* *VibC 1 through 6*	See *New-MM-C-NO-4.1*	No Adverse Effect/ Less-than-Significant Impact
3.13 Air Quality				
AQ-1: The proposed project would not conflict with or obstruct implementation of applicable air quality plans.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
AQ-2: The proposed project would not result in substantial regional air emissions.	Beneficial Effect/ Beneficial Impact	None.	None required.	Not applicable.
AQ-3: The proposed project would not expose sensitive receptors to substantial pollutant concentrations after implementation of proposed mitigation to reduce operational emissions of diesel particulate matter and other toxic air contaminants near residential uses.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	*New-MM-AQ-3.1 Equip Diesel Generators with Applicable Tiered Emissions Standards.* All diesel generators shall have engines that meet Tier 4 Final or Tier 4 Interim emissions standards or meet Tier 2 emissions standards and are equipped with a CARB Level 3 Verified Diesel Emissions Control Strategy. *New-MM-AQ-3.2 Require and Implement Ventilation Plans for Proposed Residential Land Development*. For residential development at the intercity bus facility and at the vent structure sites at 701 Third Street and Second and Harrison Streets, the project sponsor shall comply with the following measures: a. *Air Filtration and Ventilation Requirements.* Prior to receipt of any residential building permit, the project sponsor shall submit a ventilation plan for the proposed building(s). The ventilation plan shall show that the building ventilation system removes at least 80 percent of the outdoor $PM_{2.5}$ concentrations from habitable areas and be designed by an engineer certified by the ASHRAE. The engineer shall provide a written report documenting that the system meets the 80 percent performance standard identified in this measure and offers the best available technology to minimize outdoor-to-indoor transmission of air pollution. b. *Maintenance Plan.* Prior to receipt of any building permit, the project sponsor shall present a plan that ensures ongoing maintenance for the ventilation and filtration systems. c. *Disclosure to Buyers and Renters.* The project sponsor shall ensure disclosure to buyers and/or renters that the building is located in an area with existing sources of air pollution and, as such, the building includes an air filtration and ventilation system designed to remove 80 percent of outdoor particulate matter. Occupants shall be informed of the proper use of the installed air filtration system.	No Adverse Effect/ Less-than-Significant Impact
AQ-4: The proposed project would not expose people to objectionable odors.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
C-AQ-5: Construction activity would generate regional emissions of criteria pollutants and ozone precursors which would be less than the applicable standards for each pollutant.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	AC 1 – ensure that, as part of the contract provisions, the project contractor is required to implement the measures below. AC 2 – water all active construction areas at least twice daily. AC 3 – cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard. AC 4 – pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. AC 5 – sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites. AC 6 – sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. AC 7 – install sandbags or other erosion control measures to prevent silt runoff to public roadways. AC 8 – replant vegetation in disturbed areas as quickly as possible.	*New-MM-C-AQ-5.1 Prepare and Implement an Emissions Plan.* The TJPA shall comply with the following measures to reduce construction emissions: *a. Construction Emissions Minimization Plan*. Prior to issuance of a construction permit, the TJPA shall prepare a Construction Emissions Minimization Plan (Emissions Plan) detailing project compliance with the following requirements: 1. All off-road equipment greater than 25 horsepower and operating for more than 20 total hours over the entire duration of construction activities shall meet the following requirements: a. Where alternative sources of power are available, portable diesel engines shall be prohibited. b. All off-road equipment shall have the following: i. engines that meet or exceed either EPA or CARB Tier 2 off-road emissions standards, and	No Adverse Effect/ Less-than-Significant Impact

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
		AC 9 – minimize use of on-site diesel construction equipment, particularly unnecessary idling. AC 10 – shut off construction equipment to reduce idling when not in direct use. AC 11 – where feasible, replace diesel equipment with electrically powered machinery. AC 12 – locate diesel engines, motors, or equipment as far away as possible from existing residential areas. AC 13 – properly tune and maintain all diesel power equipment. AC 14 – suspend grading operations during first- and second-stage smog alerts, and during winds greater than 25 miles per hour. AC 15 – after the construction phase, power wash and/or paint buildings with visible signs of dirt and debris from the construction site (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).	ii. engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS). c. Exceptions: i. Exceptions to A(1)(a) may be granted if the TJPA has evidence that an alternative source of power is limited or infeasible at the project site, and that the requirements of this exception provision apply. Under this circumstance, the TJPA shall prepare the documentation indicating compliance with A(1)(b) for on-site power generation. ii. Exceptions to A(1)(b)(ii) may be granted if the TJPA has evidence that a particular piece of off-road equipment with an CARB Level 3 VDECS is (1) technically not feasible, (2) would not produce desired emissions reductions due to expected operating modes, (3) installing the control device would create a safety hazard or impaired visibility for the operator, or (4) there is a compelling emergency need to use off-road equipment that are not retrofitted with a CARB Level 3 VDECS. iii. If an exception is made pursuant to (A)(1)(c)(ii), the TJPA shall provide the next cleanest piece of off-road equipment, as provided by the step-down schedule below shown in (Table 3.13-7).	

Table 3.13-7
Off-Road Equipment Compliance Step-Down Schedule

Compliance Alternative	Engine Emissions Standard	Emissions Control
1	Tier 2	CARB Level 2 VDECS
2	Tier 2	CARB Level 1 VDECS
3	Tier 2	Alternative Fuel (Not a VDEC)

Notes:
CARB = California Air Resources Board; VDECS = Verified Diesel Emissions Control Strategy
Source: data compiled by AECOM in 2014

If the requirements of (A)(1)(b) cannot be met, then the TJPA shall meet Compliance Alternative 1. If the TJPA is not able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 shall be met. If the TJPA is not able to supply off-road equipment meeting Compliance Alternative 2, then Compliance Alternative 3 shall be met.

2. The TJPA shall require idling times for off-road and on-road equipment to be limited to no more than 2 minutes, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish, Chinese) in designated queuing areas and at the construction site to remind operators of the 2-minute idling limit.
3. The TJPA shall require that construction operators properly maintain and tune equipment in accordance with manufacturer specifications.
4. The Emissions 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. Off-road equipment descriptions and information shall include equipment type,

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
			equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, expected fuel usage, and hours of operation. For VDECS-installed equipment, reporting shall indicate technology type, serial number, make, model, manufacturer, CARB verification number level, installation date, and hour meter reading on installation date. For off-road equipment using alternative fuels, reporting shall indicate the type of alternative fuel being used. 5. The Emissions Plan shall be kept on-site and be available for review by any persons requesting it. A legible sign shall be posted at the perimeter of the construction site indicating to the public the basic requirements of the Emissions Plan and a way to request a copy of the plan. The TJPA shall provide copies of the Emissions Plan to members of the public as requested. *b.* *Reporting*. Monthly reports shall be prepared to indicate the construction phase and off-road equipment information used during each phase, including the information required in A(4). In addition, for off-road equipment using alternative fuels, reporting shall include the actual amount of alternative fuel used. Within 6 months of completion of construction activities, the TJPA shall prepare a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase. For each phase, the report shall include detailed information required in A(4). In addition, for off-road equipment using alternative fuels, reporting shall include the actual amount of alternative fuel used. *c.* *Certification Statement and On-Site Requirements*. Prior to the commencement of construction activities, the TJPA shall certify (1) compliance with the Emissions Plan and (2) all that applicable requirements of the Emissions Plan have been incorporated into contract specifications.	
C-AQ-6: Construction activities would not generate toxic air contaminants, including diesel particulate matter, which would expose sensitive receptors to increased pollutant concentrations.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	See *AC 1 through AC 15*	See *New-MM-C-AQ-5.1*	No Adverse Effect/ Less-than-Significant Impact
CU-AQ-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative operational air quality impacts.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-AQ-8: Construction of the proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative air quality impacts.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	See *AC 1 through AC 15*	See the following: *New-MM-AQ-3.1* *New-MM-AQ-3.2* *New-MM-C-AQ-5.1*	No Adverse Effect/ Less-than-Significant Impact
3.14 Greenhouse Gases and Climate Change				
CU-CC-1: The proposed project would not generate significant GHG emissions resulting in a significant environmental impact.	Beneficial Effect/ Beneficial Impact	None.	None required.	Not applicable.
CU-CC-2: The proposed project would be consistent with applicable plans adopted to reduce GHG emissions.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
3.15 Public Services, Community Services, and Recreational Facilities				
PS-1: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 fire protection, police protection, and emergency services.	No Adverse Effect/ Less-than-Significant Impact	Saf 1 – provide project plans to the San Francisco Fire Department for its review to ensure that the adequate life safety measures and emergency access are incorporated into the design and construction of project facilities. Saf 2 – prepare a life safety plan including the provisions of on-site measures such as a fire command post at the Terminal, the Fire Department's 800-megahertz radio system and all necessary fire suppression equipment. Saf 3 – prepare a risk analysis to accurately determine the number of personnel necessary to maintain an acceptable level of service at project facilities.	None required.	Not applicable.
PS-2: The proposed project would not adversely affect existing parks, open spaces, trails, recreational facilities, schools, or religious institutions; include construction of new recreation facilities; or conflict with applicable plans and policies.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not Applicable
C-PS-3: Construction of the proposed project would result in temporary effects on emergency response and may interfere with access to parks and community facilities, but this effect would be reduced with implementation of previously adopted mitigation measures and the DTX Design Criteria.	No Adverse Effect/ Less-than-Significant Impact	PC 7 – develop traffic management plans to, among other things, maintain access to all businesses affected by surface or cut-and-cover construction, and include provisions in construction contracts to maintain access to businesses. NoiC 1 – require compliance with the City noise ordinance, which imposes limits on construction hours and maximum noise levels from any piece of powered construction equipment. NoiC 4, PC 5, and PC 6 – require implementation of an active community liaison program to inform residents of construction plans so that they can plan around periods of particularly high noise levels and can register concerns and complaints. NoiC 5 – require contractors to employ best management practices that include performing construction in a manner to maintain noise levels at noise-sensitive land uses below specific limits, and limiting construction activities during evening, nighttime, weekend, and holiday periods. PC 2 – require contact with local businesses to understand how they carry out their work to minimize effects on business usage, delivery/shipping patterns, and critical times for business activities. AC 2 through AC 8 – require implementation of construction best management practices to reduce air emissions, including fugitive dust. AC 9 through AC 13 – impose restrictions on construction equipment that reduce air emissions and odors.	None required.	Not applicable.
CU-PS-4: Operation of the proposed project, in combination with reasonably foreseeable development, would not result in significant cumulative impacts related to public services, community services, and recreational facilities.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-PS-5: Construction of the proposed project, in combination with reasonably foreseeable development, would not result in significant cumulative impacts related to public services, community services, and recreational facilities.	No Adverse Effect/ Less-than-Significant Impact	See the following: *PC 7* *NoiC 1, NoiC 4, NoiC 5* *PC 2, PC 5, PC 6, and PC 7* *AC 2 through AC 13*	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
3.16 Safety and Security				
SS-1: The proposed project would not result in a substantial potential for accidents, such as train collisions and derailments.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
SS-2: The proposed project would not result in substantial potential safety risks for individuals on vehicles, at stations, or in parking lots.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
SS-3: The proposed project would not result in unacceptable potential security risks or threats.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
CU-SS-4: The proposed project, in combination with reasonably foreseeable development, could result in safety and security risks; however, the cumulative effect would not be adverse.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
3.17 Utilities				
UT-1: The proposed project would not require new or expanded water entitlements.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
UT-2: The project would not require the construction of new wastewater treatment facilities, exceed the capacity of the wastewater treatment provider, or exceed wastewater treatment requirements of the RWQCB.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
UT-3: The proposed project could require the construction or expansion of stormwater drainage facilities, but would be consistent with existing City requirements and the DTX Design Criteria.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
UT-4: The project would generate solid waste disposal needs, but the demand could be accommodated by the landfill serving the project area.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
UT-5: The proposed project would comply with federal, state, and local statutes and regulations related to solid waste.	No Effect/No Impact	None.	None required.	Not applicable.
UT-6: The proposed project would not require new or expanded electricity and/or natural gas entitlements.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.
C-UT-7: The proposed project would not adversely impact underground utilities during construction that could result in possible disruption of service to customers.	No Adverse Effect/ Less-than-Significant Impact	Util 1 – extensively plan and coordinate with the San Francisco Department of Public Works during future phases of design and construction.	None required.	Not applicable.
CU-UT-8: The proposed project, in combination with reasonably foreseeable development, would increase the demand on utilities; however, the cumulative effect would not be significant.	No Adverse Effect/ Less-than-Significant Impact	None.	None required.	Not applicable.

Table S-2
Summary of Proposed Project Impacts and Mitigation Measures

Impact[1]	NEPA/CEQA Effects with Previously Adopted Mitigation Measures	Previously Adopted Mitigation Measures[1]	Additional Proposed New Mitigation Measures	NEPA/CEQA Effects with New Mitigation Measure(s)
3.18 Environmental Justice Communities				
EJ-1: The proposed project would not disproportionately impact ethnic minority or low-income populations.	No Adverse Effect/ analysis not required under CEQA	None.	None required.	No Adverse Effect

Notes:
[1] The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR.
2004 EIS/EIR = 2004 Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Final Environmental Impact Statement/Environmental Impact Report
ARDTP = Archaeological Research Design and Treatment Plan
BAAQMD = Bay Area Air Quality Management District
BART = Bay Area Rapid Transit
CARB = California Air Resources Board
CDFW = California Department of Fish and Wildlife
CEQA = California Environmental Quality Act
City = City and County of San Francisco
DTX = Downtown Rail Extension
DURF = Demolition, Utility Relocation, New Transit Center Foundation Excavation
EMF = electromagnetic field
EMI = electromagnetic interference
EPA = U.S. Environmental Protection Agency
ERO = Environmental Review Officer
GHG = greenhouse gas
MBTA = Migratory Bird Treaty Act
MOA = Memorandum of Agreement
Muni = San Francisco Municipal Railway
NEPA = National Environmental Policy Act
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter
RWQCB = Regional Water Quality Control Board
SHPO = State Historic Preservation Officer
TJPA = Transbay Joint Powers Authority
USFWS = U.S. Fish and Wildlife Service
VDECS = Verified Diesel Emissions Control Strategy

CHAPTER 1 PURPOSE AND NEED FOR THE PROJECT

1.1 INTRODUCTION

The Federal Transit Administration (FTA), in cooperation with the Federal Railroad Administration (FRA) and the Transbay Joint Powers Authority (TJPA), are preparing a Supplemental Environmental Impact Statement/Environmental Impact Report (SEIS/EIR) to the 2004 Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Transbay Program) Final EIS/EIR and subsequent addenda.[1] This SEIS/EIR evaluates refinements to the approved Downtown Rail Extension (DTX) component of the Transbay Program, as well as other transportation improvements associated with the Transbay Program (proposed project). Key proposed changes to the program that are addressed in this SEIS/EIR consist of refinements to the track curvature entering the Transbay Transit Center (Transit Center), extension of the below-grade rail levels of the Transit Center to enable high-speed rail (HSR), refined designs and siting for the ventilation structures and emergency exits in response to safety standards, and other transportation improvements necessary for implementing the Transbay Program and enhancing connectivity to the regional rail and bus services that would be available at the Transit Center. This SEIS/EIR is required to provide environmental analysis of these project components and to supplement the 2004 Final EIS/EIR (FEIS/EIR).

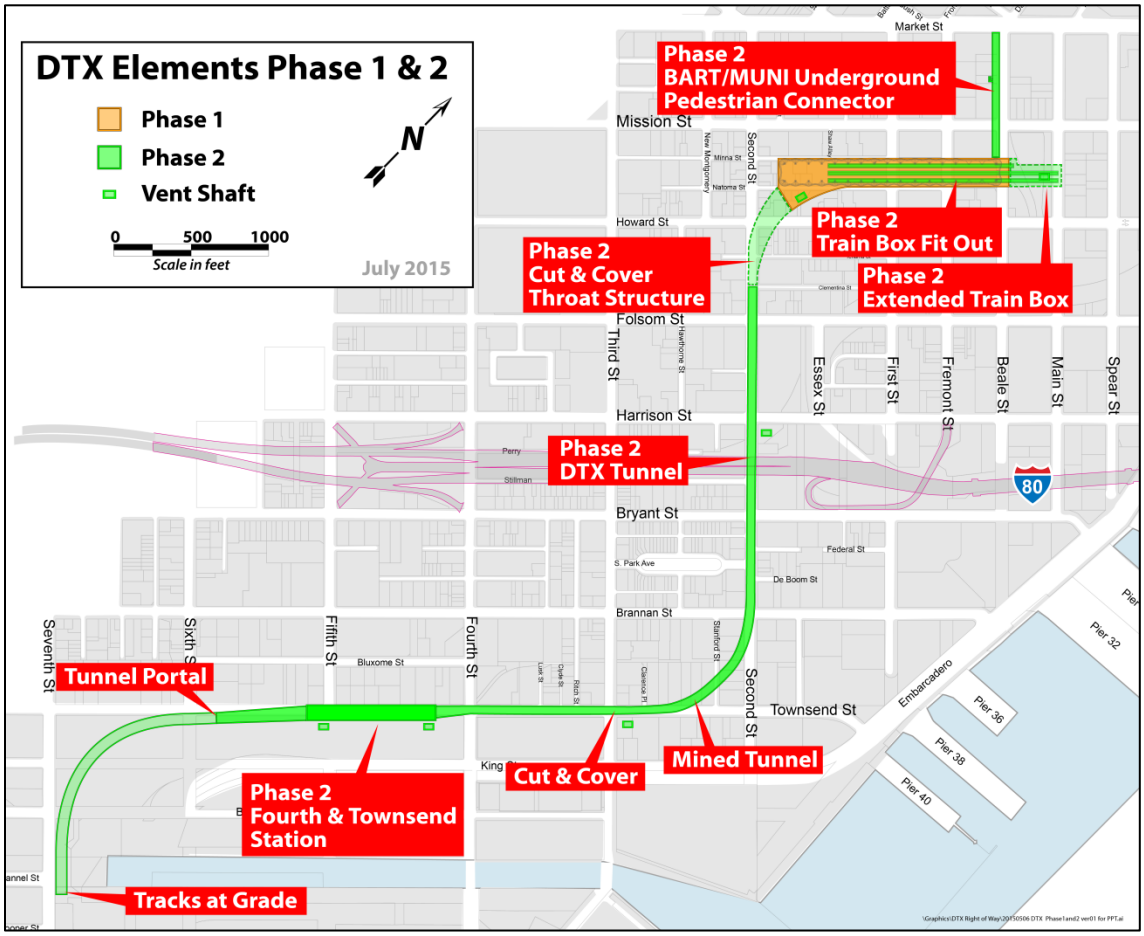
The Transbay Program, approved in 2004, is divided into two construction phases. Phase 1, which is currently under construction, consists of the new Transit Center and the train box, which is the subterranean portion of the Transit Center that would house the Caltrain and high-speed rail station and all train-related systems and components of the Transit Center building. Construction of Phase 1 began in 2008 with the Temporary Terminal. Phase 1 of the Transit Center is anticipated to be complete in 2017. Phase 2 includes improvements such as the extension of the existing Caltrain rail line to the Transit Center as previously approved (also known as the DTX), and completion of the Transit Center below-grade levels

[1] Section 1.3, Related Studies and Reports, provides full citations for these documents, and Section 2.1.2, Transit Center and Transportation Modifications to the Approved Transbay Program, provides summaries of the addenda.

for rail operations. Table 1-1 summarizes the relationships between the approved Transbay Program and the proposed project, and Figure 1-1 illustrates DTX elements of the proposed project.

Table 1-1
Relationship Between the Approved Transbay Program and the Proposed Project

Common Project-Related References	Definition/Explanation
Locally Preferred Alternative (LPA)	Approved Transbay Program consists of a Phase 1 and Phase 2 (Phase 1 under construction); also referred to as the No Action Alternative for this SEIS/EIR
Phase 2	Downtown Rail Extension (DTX) plus other improvements; Phase 2 includes more than DTX
DTX	Major component of Phase 2, involving Downtown Rail Extension and related improvements to support rail service
Proposed Project	DTX changes/refinements and other improvements that may or may not be part of Phase 2; also referred to as Refinements to Approved Transbay Program plus new components



Sources: City and County of San Francisco 2013; Compiled by TJPA 2015
Note: The BART/Muni pedestrian underground connector is identified as a Phase 2 DTX element in this figure, because it was considered in the 2004 FEIS/EIR. However, this component is presented and evaluated as an "Other Transportation Improvement" in this SEIS/EIR.

Figure 1-1 DTX Elements Under the Proposed Project

The Caltrain line is a vital regional commuter rail service connecting San Francisco to the Peninsula, Silicon Valley, and San Jose, but its current northern terminus in San Francisco is approximately 1.3 miles[2] from downtown and the heart of the San Francisco financial and office core. The DTX would provide this "missing link" to connect several modes of transportation at the Transit Center.

This SEIS/EIR incorporates by reference information contained in the 2004 FEIS/EIR and evaluates:

- new potential significant environmental impacts or substantial increases in the severity of previously identified significant environmental impacts due to specific refinements to Phase 2 components of the Transbay Program;
- the potential impacts of other transportation improvements proposed for consideration by the TJPA;
- changes in circumstances and existing conditions under which the proposed project would be implemented since the original documentation was prepared; and
- new information as required by federal and state environmental legislation: the National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act (CEQA).

The FTA and TJPA prepared this SEIS/EIR in accordance with NEPA, 42 U.S. Code (USC) Section 4321 et seq.; the Council on Environmental Quality regulations for implementing NEPA, 40 Code of Federal Regulations (CFR), Parts 1500–1508; FTA and FHWA joint regulations for implementing NEPA at 23 CFR Part 771; CEQA, California Public Resources Code (PRC), Section 21050 et seq.; the State CEQA Guidelines, California Code of Regulations (CCR), Title 14, Division 6, Chapter 3, Sections 15000 et seq.; National Historic Preservation Act (NHPA) 54 USC 300101 et seq.; and Section 4(f) of the Department of Transportation Act of 1966, as amended (49 USC 303 and 23 USC 138) and the FTA and FHWA joint implementing regulation at 23 CFR Part 774. The SEIS/EIR was also prepared in accordance with provisions of the Moving Ahead for Progress in the 21st Century (MAP-21) program, which took effect on October 1, 2012, and supersedes the prior federal transportation authorization requirements of the 2005 Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). FTA is the NEPA lead agency, and TJPA is the CEQA lead agency and joint lead agency under NEPA per 23 CFR 771.109(c)(2). FRA is a cooperating agency.

1.2 PURPOSE AND NEED FOR THE ORIGINAL TRANSBAY PROGRAM AND FOR THE PROPOSED PROJECT

1.2.1 Approved Transbay Program

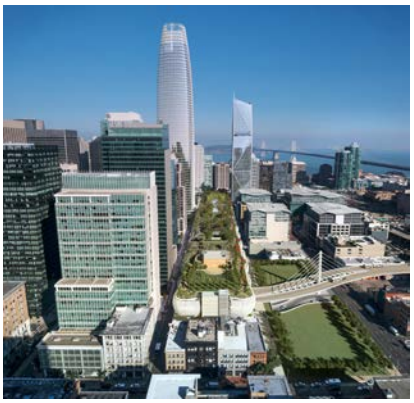
The Transbay Program was developed to address the following purposes set forth in Chapter 1 of the 2004 FEIS/EIR:

- Improve public access to bus and rail services
- Modernize the Transbay Terminal and improve service
- Reduce non-transit vehicle usage
- Alleviate blight and revitalize the Transbay Terminal area

[2] 1.3 miles is the length of the extension of Caltrain service from the Fourth and King Station to the Transit Center.

FTA, the City and County of San Francisco (City), the Peninsula Corridor Joint Powers Board, and the San Francisco Redevelopment Agency (now known as the San Francisco Office of Community Investment and Infrastructure [OCII]), approved the Transbay Program in order to transform a transit connection with outdated facilities into a modern transit center; create a new mixed-use area to complement the transit services; enhance local and regional connectivity to the San Francisco Bay Area's transit systems; and advance the region's environmental goals to improve air quality. Specifically, the following project objectives and needs were identified in the 2004 FEIS/EIR:

- Provide a multi-modal transit facility that meets future transit needs
- Improve the Transbay Terminal as a place for passengers and the public to use and enjoy
- Alleviate conditions of blight in the Transbay Terminal area
- Revitalize the Transbay Terminal area with a more vibrant mix of land uses that includes both market-rate and affordable housing
- Facilitate transit use by developing housing next to a major transit hub
- Improve Caltrain service by providing direct access to downtown San Francisco
- Enhance connectivity between Caltrain and other major transit systems
- Enable direct access to downtown San Francisco for future intercity and/or high-speed-rail service
- Accommodate projected growth in travel demand in the San Jose–San Francisco corridor
- Reduce traffic congestion on U.S. Highway 101 and Interstate 280 between San Jose and San Francisco and other routes
- Reduce vehicle hours of delay on major freeways in the Peninsula corridor
- Improve regional air quality by reducing auto emissions
- Support local economic development goals
- Enhance accessibility to employment, retail, and entertainment opportunities



1.2.2 DTX Refinements, Other Transportation Improvements, and Development Opportunities under the Proposed Project

The above project objectives of the Transbay Program still apply for the proposed project. However, further engineering for the DTX, more detailed input about HSR design requirements, and recent adoption by the City of the Transit Center District Plan (TCDP) for much of the area surrounding the Transit Center have prompted proposed refinements to Phase 2 of the Transbay Program and suggested additional transportation improvements not previously identified in the 2004 FEIS/EIR in the proposed project area. As a result, additional project objectives for the proposed project have been analyzed and include the following:

- Enhance pedestrian, bicycle, and transit connections to further reinforce the Transbay Program's emphasis on transit and alternative means of local and regional travel.
- Modify the train box and advance construction of other rail-related infrastructure to respond to design specifications issued by the California High-Speed Rail Authority (CHSRA) to enable HSR service and Caltrain.
- Offer additional opportunities for parking within convenient walking distance of the area's existing and proposed restaurants and entertainment, performance, and sports venues.
- Locate sites for and construct ventilation shafts/emergency tunnel exit structures in compliance with safety standards for underground facilities and to meet emergency response needs of system operations.

In addition to the above project objectives which address transportation-related refinements to the approved Transbay Program and define the proposed action for NEPA analysis, the proposed project would:

- Promote opportunities to develop land uses in conjunction with the proposed project's transportation facilities in a manner consistent with the City's land use goals and supportive of transit use.

This objective is not part of the purpose and need for NEPA, but is an objective that is relevant for the City and TJPA and is included as part of the proposed project for CEQA purposes.

1.2.3 Need for the Proposed Project

Refinements to the DTX and other transportation improvements in the proposed project area are needed to support continued transportation needs in the region, conform to updated design specifications from the CHSRA, and meet an ever-increasing need for transportation improvements in this area of San Francisco. Other proposed project components concerning localized transportation and transit improvements and ventilation structure/emergency exit locations reflect further design by TJPA and modifications to planning and development conditions that did not exist at the time of the 2004 FEIS/EIR.

Promoting joint development opportunities would support the development goals and needs of the City's Planning Department and the San Francisco OCII.

Upgrade Intermodal Connection and Services

The Transbay Program was, in part, developed because the previous Transbay Terminal, which was built in 1939, did not meet current seismic safety or space utilization standards. The new Transit Center provides an opportunity to revitalize the surrounding area and to extend Caltrain service from its current terminus outside the downtown area, at Fourth and King Streets, into the San Francisco employment core surrounding the Transit Center. As introduced above, this extension is referred to as the DTX.

DTX would enable Caltrain service to better interconnect with local and regional transit services at the new multimodal Transit Center, and provide a transit alternative for commuters who currently do not have a direct Caltrain link to the core employment and financial area of San Francisco. Extending Caltrain into downtown would save commuters up to 1 hour per day (TJPA 2008a) in travel time, and would result in less driving and more people taking the train into the City from the Peninsula. The 2013 Caltrain Annual Passenger Counts report found that Caltrain modified its operations in October 2012 to respond to increased ridership and to relieve crowded trains by adding six trains and one stop to 12 existing train routes (Caltrain 2013). Caltrain's average weekday ridership is showing an upward trend; ridership increased by 11.1 percent from 2012 to 2013. Since 1997, Caltrain's average weekday ridership has increased by more than 90 percent, and, with the exception of a decrease in 2010, ridership has been steadily increasing each year since the summer of 2004 (Caltrain 2013).

The 2004 FEIS/EIR included qualitative and quantitative estimates of changes in transit ridership as a result of the Caltrain extension to the Transit Center. Overall, it was estimated that ridership would increase for Bay Area Rapid Transit (BART) to the East Bay, Alameda–Contra Costa Transit District (AC Transit), and Golden Gate Transit as a result of the increased connectivity between the providers. Similarly, the addition of HSR service to downtown San Francisco would bring more riders (in addition to any new riders resulting from Caltrain service) to the transit providers that operate nearby (FRA 2010a). FRA's 2010 Final Program EIS Reevaluation, updating the 2004 FEIS/EIR, increased high-speed train ridership estimates over those from the 2004 FEIS/EIR and identified the means of access to the Transit Center. In the 2010 Final Program EIS Reevaluation, forecasts of the number of passengers per day arriving by different transit operators to serve the high-speed train alone in 2035 (FRA 2010a) include San Francisco Muni, 12,000; BART to/from East Bay, 2,000; AC Transit, 2,000; and Golden Gate Transit, 1,000.

In light of increased Caltrain ridership, service improvements, and demands related to HSR service, a need to support and enhance future intermodal transportation connections continues at and around the Transit Center. The proposed project contains design refinements necessary for Caltrain and HSR services to function and to provide better interconnections with other transportation services in the project area.

Support High-Speed Rail Service

In June 2000, the CHSRA issued its Final Business Plan for Building a High-Speed Train System for California. This document recommended that the State Legislature and Governor initiate a state program EIR and federal EIS for the HSR network. The document presented the Caltrain corridor as the desired route, and stated that terminating HSR trains at the Transbay Terminal in San Francisco should be included in environmental studies (FTA 2004).

Phase 1 of the Transbay Program consists of construction of the Transit Center, including the below-grade train box that would eventually accommodate the DTX tracks, station, and ancillary facilities. The lower level of the train box would serve Caltrain and HSR trains, and consist of six tracks and three platforms—two dedicated for Caltrain and the remaining four for HSR trains. An illustrative image of the proposed loading platforms is presented below. The first level of the Transit Center below-grade, referred to as the Lower Concourse, would serve as a rail passenger ticketing and waiting area (FRA 2010b). Under Phase 2, construction of the DTX and the "throat structure" would occur. The throat structure would provide the connection between the tunnel that would be constructed along Second Street for rail service and the train box below the Transit Center, which is where the platforms and operating and communication systems for Caltrain and HSR trains would be housed.

High-Speed Rail Design Specifications. The CHSRA identifies a minimum 900-foot horizontal curve radius for low-speed tracks (Technical Memorandum 2.1.8) and a minimum horizontal radius for curves where speeds are less than 125 miles per hour for station tracks (Technical Memorandum 2.1.3) (CHSRA 2009). Strict compliance with these minimum standards would require significant property acquisitions at the western end of the train box where Caltrain and HSR tracks approach the train box from the west. Estimates by the TJPA indicate that eight additional properties would be affected on Second Street, ranging from a 37,100-gross-square-foot building to an 837,735-gross-square-foot, 35-story office tower (TJPA 2011a). The CHSRA agreed, with conditions, that a smaller 650-foot horizontal curve radius would be acceptable. As part of the review of the train box and platforms, the HSR tracks and platforms were shifted to the south side of the box, and the train box was extended to accommodate safety measures and to comply with a minimum of 1,315 feet of tangent track alongside the loading platform (Spaethling, pers. comm., 2011). As a result of these changes, the TJPA needs to revise its plans for the track alignment, the throat structure, and the length of the train box to accommodate HSR service.

Future High-Speed Rail Alignment. The existing Caltrain railyard at Fourth and King Streets is proposed to be modified to accommodate the DTX, including new underground tracks leading into the DTX and a below-grade Fourth and Townsend Station. The tracks would travel at-grade along Seventh Street, and as they curve eastward into the railyard, would descend to an underground alignment via a retained cut, or U-wall. In the future, Caltrain and HSR trains may travel along Seventh Street below-grade. To enable this future configuration and the DTX improvements, a partial tunnel box that would end—or "tunnel stub"—at the current Caltrain yard limits would be constructed under the U-wall to conform to the future profile of the tracks. Because construction equipment and crews would already be constructing the DTX facilities, including the U-wall and the underground Fourth and Townsend Street Station, it would be cost effective and less disruptive to construct the tunnel stub box concurrently. Doing so also would avoid re-disturbing this area, which would occur if DTX improvements were constructed and then, subsequently, a Caltrain and HSR tunnel connection alignment were to be implemented. Installation of a partial tunnel box during the DTX construction would reduce environmental impacts associated with subsequent construction needed to enable a HSR tunnel at a later date. Design of the tunnel box stub would not preclude service to existing Caltrain stations.

Serve Growing Transportation Needs in the Project Area

The 2004 FEIS/EIR identified a pressing need to alleviate a burdened transportation network and to serve new development envisioned as part of the Redevelopment Plan component of the Transbay Program.

Since 2004, this need has continued to expand with new development and City-sponsored plans promoting growth and transportation improvements in the vicinity of the Transit Center. The proposed project contains design refinements necessary for the approved Transbay Program to help serve the future transportation needs in the region and immediate project area.

Growth in the Project Area. The City's C-3 zoning district encompasses the downtown commercial area and is expected to accommodate a substantial amount of the City's projected population and employment growth. This area includes the Transbay, Rincon Hill, and Yerba Buena planning areas, and the Civic Center, Union Square, Chinatown, Tenderloin, and parts of East South of Market (SoMa) districts (City of San Francisco 2012). An analysis of market trends and planning efforts predict that an additional 15,000 households and 30,000 residents would be in this downtown area between 2005 and 2030—almost 50 percent more households and a 60 percent increase in population from 2005 (City of San Francisco 2012). An additional 61,000 jobs, a 26 percent increase, is projected for this area between 2005 and 2030. Within the downtown area, development in the TCDP area, which encompasses the area around the Transit Center and includes much of the Redevelopment Plan component of the Transbay Program, is expected to comprise 42 percent of the increase in downtown households, 32 percent of the increase in household population, and 21 percent of the increase in employment between 2005 and 2030 (City of San Francisco 2012). As part of the Central SoMa Plan, existing land use restrictions around the southern portion of the Central Subway transit line would be revised to allow a greater mix of uses while also emphasizing office uses; height limits on certain sites would be increased; and the system of streets and circulation would be modified to facilitate growth in the Central SoMa area. These changes would potentially add 3,490 residential units, 5,563,700 commercial square feet, and 27,820 jobs (City of San Francisco 2013).

Demand for Greater Parking Options in the Transit Center District Plan Area. Economic and population growth in the TCDP area is expected to generate a demand for approximately 8,320 parking spaces during the evening peak period (City of San Francisco 2012). However, the maximum amount of parking that could be provided in the TCDP area is approximately 3,950 with valet operations; the shortfall would be approximately 4,370 spaces (City of San Francisco 2012). Because of substantial economic growth projected out to 2030, additional parking in the vicinity is needed to serve the neighborhood and others attracted to the area during special events and non-work hours.

Bicycle and Pedestrian Circulation and Growth. In terms of bicycle travel demand and circulation, the San Francisco Bicycle Plan (2010) identified the need to provide barrier-free bicycle access and state-of-the-art bicycle parking facilities. Actions 3.8 through 3.10 contained within the San Francisco Bicycle Plan state the need for the following:

- work with the CHSRA to ensure bicycles are accommodated on its long-distance trains,
- work with transit operators and the Metropolitan Transportation Commission (MTC) to develop intermodal bicycle access, and
- promote bicycle parking stations at major transit hubs.

According to the San Francisco Bicycle Plan, approximately 2.5 percent of San Francisco residents bicycle to work, which is five times the national average of 0.5 percent and three times the state average of 0.8 percent (SFMTA 2009).

In December 2010, the City adopted a Better Streets Plan, which provided a blueprint for the future of San Francisco's pedestrian environment. The focus of the Better Streets Plan is on improving the pedestrian experience to provide a memorable, diverse, and vibrant place for commerce, human comfort,

and healthy lifestyles. Chapter 3, Section 7.4 of the Better Streets Plan outlines the need to "Emphasize improvements to streets that link to major transit nodes and transfer points" (City of San Francisco 2010). The TCDP echoes the Better Streets Plan to support the need to "prioritize pedestrian amenity and safety," and to "implement and require transportation demand management strategies to minimize growth in auto trips and reduce volumes as necessary" (City of San Francisco 2012). San Francisco is a pedestrian-oriented city as a result of its high density of development, low level of resident automobile ownership, availability of transit options, and provision of extensive pedestrian amenities (SFMTA 2009). Out of U.S. cities with at least 250,000 people, San Francisco has the third-highest percentage (9.6 percent) of commuters who walk to work, behind Boston and Washington, D.C. (SFMTA 2009). The increased development density and projected growth would result in a greater number of residents and employees, and an increase in bicycle and pedestrian travel. Therefore, continuous improvements to the pedestrian and bicycle systems are needed to support the goals of the San Francisco Planning Department and the Transbay Program.

Advance Regional Needs to Improve Transportation and Environmental Quality

In July 2013, the MTC and the Association of Bay Area Governments jointly approved the 2040 Regional Transportation Plan that designates the DTX as a regional priority for transit investment and an important means to achieving the region's Sustainable Communities Strategy. The Regional Transportation Plan and the Sustainable Communities Strategy work hand-in-hand to expand housing and transportation choices, create healthier communities, and build a stronger regional economy. Jointly referred to as "Plan Bay Area," this policy document signals the San Francisco Bay region's first long-range plan to meet the requirements of the state's landmark Senate Bill 375, which requires each of the state's metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks.

Between 2010 and 2040, the San Francisco Bay Area is projected to add 1.1 million jobs, 2.1 million people, and 660,000 homes. The San Francisco Bay Area is currently ranked as the third most congested region in hours of delay caused by congestion, and is anticipated to experience increased traffic congestion related to employment growth (MTC and ABAG 2013). In the past, adding roadway capacity was the response to congestion. However, with today's mature system of roadways and increased demands on financial resources, the region needs to find ways to operate existing highway and transit networks more efficiently and to target expansion projects that would provide long-term and sustainable congestion relief (MTC and ABAG 2013).

One of the investment strategies identified in Plan Bay Area is to make a greater financial commitment to the public transit system, which would help reduce the number of vehicles on the roads, fight congestion, and curb greenhouse gas emissions (MTC and ABAG 2013). Downtown San Francisco already experiences congestion that results in average bus transit and automobile speeds below 10 miles per hour. The City has plans for further growth in the downtown area in the future; however, unless measures are taken to improve congestion, downtown streets would be unable to accommodate expected levels of housing and job growth (MTC and ABAG 2013).

To plan transportation investments that do not exceed the revenues that are reasonably expected to be available, the MTC worked with partner agencies and used financial models to forecast how much revenue would be available for transportation purposes over

the 28-year duration of Plan Bay Area (MTC and ABAG 2013). MTC's Resolution 3434, a framework identifying regional transit priority projects for federal New Start and Small Starts, was adopted in 2001. Resolution 3434 identified the "Caltrain Downtown Extension" as RTPID 230290 and as one of the region's priority transit and road projects. Building on Resolution 3434 and results of the performance assessments and a transit-specific project evaluation, Plan Bay Area identified the DTX as one of the significant future transit investments for the next generation of federal New Starts and Small Starts funding. The proposed project contains design refinements necessary for this future transit investment to help attain the desired environmental goals.

Respond to Further System Safety Planning

Emergency ventilation/smoke-evacuation shafts and emergency tunnel exit structures are important and required features to ensure adequate life safety and emergency response for people using rail systems. The potential environmental impact from these structures was analyzed in the 2004 FEIS/EIR; however, the locations have changed as the design advanced. The design and location of these emergency structures need to comply with fire protection and life safety requirements for underground, surface, and elevated fixed guideway transit and passenger rail systems established by the National Fire Protection Association (NFPA). In accordance with NFPA Standard 130, emergency exit shaft spacing within underground or enclosed fixed guideway transit and passenger rail systems must not be separated by more than 2,500 feet. The City also oversees fire safety requirements for tunnels exceeding 300 feet. In accordance with Section 511–Local Fire Safety Feature Requirements, the vent structures are also needed to serve as air replenishment systems.

1.3 RELATED STUDIES AND REPORTS

Because this SEIS/EIR expands on and supplements the 2004 FEIS/EIR and subsequent environmental documentation by the FRA for high-speed rail service, those earlier documents are incorporated by reference and are available for review from 9 a.m. to 5 p.m., Monday through Friday, at the offices of the TJPA, 201 Mission Street, San Francisco, California, and on the TJPA's website at http://transbaycenter.org/tjpa/documents/environmental-documents. These earlier documents are summarized in Chapter 2. The 2004 Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project is summarized in Section 2.1.1, and the subsequent addenda and project modifications are summarized in Section 2.1.2. FTA and FRA found that those project modifications were adequately evaluated in the 2004 FEIS/EIR, and would not result in new adverse impacts. Table 2-1, Key Transbay Program Milestones, found in Chapter 2 also provides a summary of the Transbay Program approved with environmental clearances and subsequent refinements to the project. The following documents are incorporated by reference:

- U.S. Department of Transportation, Federal Transit Administration, City and County of San Francisco, Peninsula Corridor Joint Powers Board, and San Francisco Redevelopment Agency. 2004 (March). Final Environmental Impact Statement/Environmental Impact Report and Section 4(f) Evaluation for Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project. State Clearinghouse No. 95063004. San Francisco, CA.

- TJPA. 2006. First Addendum to the 2004 Transbay Terminal/Downtown Extension/ Redevelopment Project Final EIS/EIR. May 25. Written in association with Hatch Mott McDonald & EPC Consultants for TJPA. Adopted by the TJPA Board of Directors on June 2, 2006, San Francisco, CA.

- TJPA. 2007 (April 17). Second Addendum to the 2004 Transbay Terminal/Downtown Extension/ Redevelopment Project Final EIS/EIR. Adopted by the TJPA Board of Directors on April 17, 2007, San Francisco, CA.

- TJPA. 2008 (January 17). Third Addendum to the 2004 Transbay Terminal/Downtown Extension/Redevelopment Project Final EIS/EIR. Adopted by the TJPA Board of Directors on January 17, 2008, San Francisco, CA.

- TJPA. 2008 (October 17). Fourth Addendum to the 2004 Transbay Terminal/Downtown Extension/Redevelopment Project Final EIS/EIR. Adopted by the TJPA Board of Directors on October 17, 2008, San Francisco, CA.

- TJPA. 2009 (April 9). Fifth Addendum to the 2004 Transbay Terminal/Downtown Extension/ Redevelopment Project Final EIS/EIR. Adopted by the TJPA Board of Directors on April 9, 2009, San Francisco, CA.

- TJPA. 2011 (December 11). Sixth Addendum to the 2004 Transbay Terminal/Downtown Extension/Redevelopment Project Final EIS/EIR. Adopted by the TJPA Board of Directors on December 11, 2011, San Francisco, CA.

- TJPA and Program Management and Project Controls. 2009 (May). Transbay Transit Center Program DTX Design Criteria.

- U.S. Department of Transportation, Federal Railroad Administration. 2010 (May). Transbay Program Final EIS Reevaluation – Updating the Transbay Program 2004 Final EIS for Adoption by the Federal Railroad Administration.

- U.S. Department of Transportation, Federal Railroad Administration. 2010 (August). Record of Decision for the Transbay Transit Center Train Box.

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CHAPTER 2 PROJECT ALTERNATIVES

2.1 PROJECT HISTORY AND OVERVIEW

This section describes the planning and decision-making history of the Transbay Program that culminated with approval of the Locally Preferred Alternative (LPA), a term used by the Federal Transit Administration (FTA) to describe a set of project improvements representing the preferred project by the local sponsors. The LPA consists of three major components that are described below in Section 2.1.1, 2004 Approved Transbay Program. The three major components collectively described as the LPA are hereafter referred to as the approved Transbay Program. The Transbay Program has a long history, dating back to the 1980s, and is a transportation and land use project intended to transform a traditionally job-rich district in San Francisco south of Market Street and the San Francisco Bay Area's regional transportation system by creating a "Grand Central Station of the West" in the heart of a new transit-friendly neighborhood. The program will construct a modern regional transit hub (referred to as the Transit Center). This intermodal connection ultimately will serve eight Bay Area counties and California through 11 transit systems: AC Transit, BART, Caltrain, Golden Gate Transit, Greyhound, San Francisco Municipal Railway (Muni), SamTrans, WestCAT Lynx, Amtrak, Paratransit, and future HSR service from San Francisco to Los Angeles/Anaheim.

The Transbay Program also will extend Caltrain service underground from Caltrain's current terminus at the Fourth and King Street Station into the new downtown Transit Center, which is under construction. Approval of the LPA followed the Transbay Terminal/Caltrain Downtown Extension[1]/Redevelopment Project Final EIS/EIR (2004 FEIS/EIR). A summary of the history related to the Transbay Program, and a summary of the project approved with environmental clearances and the subsequent refinements to the project, is provided in this overview, following Table 2-1.

2.1.1 2004 Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Approved Transbay Program)

The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Transbay Program) originated from a need to improve public access to bus and rail services, modernize the Transbay Terminal, reduce non-transit vehicle usage, and revitalize the Transbay Terminal area. The Transbay Program provides an opportunity to extend Caltrain service from its terminus at Fourth and King Streets into San Francisco's employment core (FTA 2004). The underlying need for the Downtown Rail Extension (DTX) is to get the trains as close as possible to where most riders want to go. The distance between the existing Fourth and King Street Caltrain Station and most downtown San Francisco job destinations is beyond walking distance for the majority of train riders, and requires a transfer to the San Francisco Muni Metro light rail line or Muni bus service to complete the journey, adding to travel times and cost. Studies found that extending rail service to the Transbay Terminal directly would serve the train riders, eliminate delay or wait times required to transfer between modes, and be competitive with auto travel (FTA 2004).

The approved Transbay Program consists of three major components (see Figure 2-1):

1. **Phase 1:** Replacing the Transbay Terminal with a new Transit Center to serve as a multi-modal transit/transportation facility that incorporates the principles of sustainability and environmental responsibility at First and Mission Streets in downtown San Francisco. During demolition and construction, a Temporary Terminal surface facility is serving all buses that formerly used the Transbay Terminal until the new Transit Center building and bus ramps are constructed. This phase is currently under construction.

[1] The "Caltrain Downtown Extension" was used in the 2004 FEIS/EIR. It is now referred to as the "Downtown Rail Extension" (or DTX) for the proposed project.

Table 2-1
Key Transbay Program Milestones

Metropolitan Transportation Commission (MTC) identified an underground Caltrain extension to a station near the Transbay Terminal site as "the single most important improvement that can be made to the Peninsula commuter line."	1987
1989	Loma Prieta earthquake raised seismic safety concerns about the Transbay Terminal.
Caltrans and Office of State Architect released alternative designs for improvements to the terminal. City and Caltrans agreed it was reasonable to replace the terminal.	1992
1993	Caltrans and MTC conducted a "Transit Needs Study." Caltrans proceeded with critical seismic and safety improvements. City Planning Department prepared "Transit Terminal Study."
City and Caltrans agreed to undertake alternatives study. San Francisco Board of Supervisors created the Transbay Redevelopment Survey Area.	1994
1995–1996	Terminal upgrade and replacement alternatives studied by San Francisco Redevelopment Agency/Planning Department, Caltrans, Policy Advisory Committee, Citizens Advisory Committee, and Technical Advisory Committee.
"Transit Terminal Decision Report" presented three primary options.	1995
1996	*San Francisco Board of Supervisors recommended Main/Beale site as the preferred bus terminal alternative and proposed underground Caltrain terminal.*
"Caltrain San Francisco Downtown Extension Project Conceptual Design Draft EIS/EIR" prepared. Environmental process did not proceed due to lack of sufficient funding for the project.	1997
1997	Draft EIR for the Transbay Terminal Redevelopment Area Plan and new Transbay Terminal was prepared, but the project was terminated before the Draft EIR was circulated.
MTC began operations as the Bay Area Toll Authority and began the "Transbay Terminal Improvement Plan" study. Transbay Panel Working Group and Executive Committee formed.	1998
1999	San Francisco Board of Supervisors passed resolution repealing former endorsement of Main/Beale site and for the "City and County of San Francisco to work expeditiously with AC Transit, the MTC, and Caltrans to retain AC Transit regional bus service at the current Transbay Terminal site."
Phase 1 of the Transbay Terminal Improvement Plan study completed. Phase 2 evaluated three terminal design concepts.	1999
1999	*San Francisco voters approved Proposition H, which provides that Caltrain should be extended from Fourth/King Street terminus to the site of the Transbay Terminal at First and Mission Streets.*
Refinements made to the design concept.	2000
2004	*Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Final EIS/EIR Certified.*
Record of Decision for Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Final EIS/EIR issued.	2005

Table 2-1
Key Transbay Program Milestones

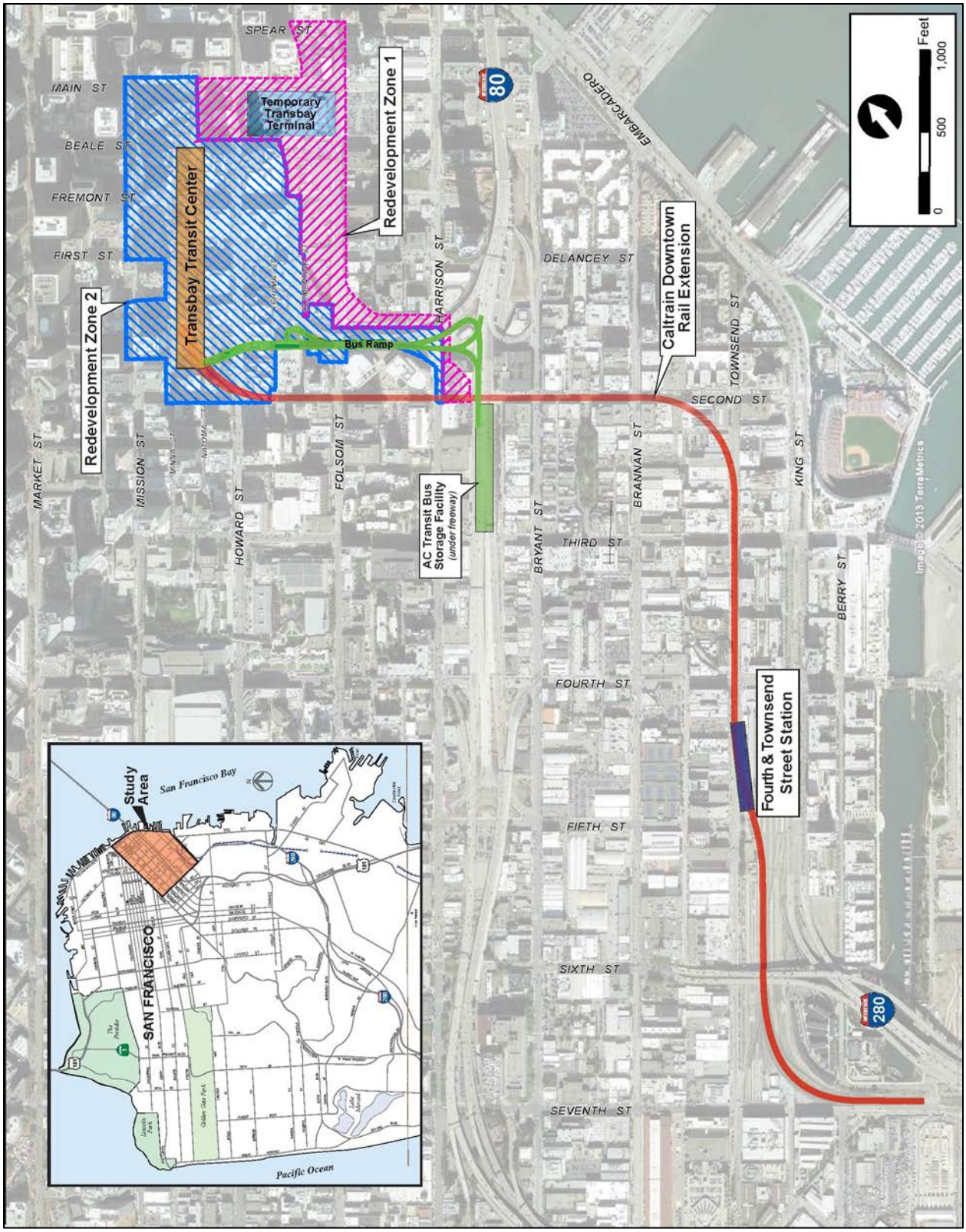
2006	*First phase defined as the Transit Center, and second phase defined as the Caltrain extension and the throat structure (First Addendum).*
Design provisions to allow future construction of a loop around the Transit Center and delay of the construction of the tail tracks on Main Street (Second Addendum).	2007
2007	San Francisco Planning Department initiated planning effort for Transit Center District Plan (covering an area surrounding the Transit Center and superseding portions of the Transbay Program Redevelopment Plan).
Included additional parcel required for Transit Center (Third Addendum).	2008
2008	Design changes made to the Temporary Terminal (Fourth Addendum).
Transit Center design changes made (Fifth Addendum).	2009
2009	Draft Transit Center District Plan published, recommending changes to zoning in a portion of the Transbay Program.
2004 EIS Reevaluation and Record of Decision by FRA for funding the train box at the lower levels of the Transit Center.	2010
2011	Design changes made to the bus ramps between Interstate 80 and the Transit Center (Sixth Addendum).
Transit Center District Plan Final EIR Certified.	2012

Note:
Italicized milestones relate to the DTX component of the Transbay Program.
Source: Compiled by AECOM in 2013

2. **Phase 2:** Constructing an underground extension and related facilities for Caltrain commuter rail service from its current San Francisco terminus at the Fourth and King Street Station (also referred to as DTX) to a new underground terminus in the lower levels of the new Transit Center and providing for future HSR service to the Transit Center. Phase 2 also includes completion of the below-grade levels of the Transit Center for rail operations. This phase will commence when adequate funding is approved.

3. **Redevelopment Plan:** Implementing a Redevelopment Plan for the Transbay Redevelopment Project Area (Transbay Redevelopment Plan) and related development projects, including transit-oriented development. The plan and related development permit tax increment financing to assist in financing the transportation improvements and other redevelopment projects. The redevelopment area consists of the Transbay Residential Zone (Zone 1) and the Transbay C-3 Zone (Zone 2).[2] Development in the project area is already underway pursuant to the plan.

[2] Transbay Residential Zone (Zone 1) is under the jurisdiction of the San Francisco Office of Community Investment and Infrastructure (OCII) and is planned for office space, new housing, new neighborhood retail space, and public improvements such as widened sidewalks and new public open space. The Transbay C-3 Zone (Zone 2), now the Transbay C-3 Commercial Special Use District (C-3-O[SD]), is primarily under the City's jurisdiction through the Planning Department. The C-3-O(SD) district contains additional land-use controls to implement the Transbay Redevelopment Plan. In general, these controls require proposed development within the C-3-O(SD) district to undertake streetscape improvements, deposit fees into the Downtown Open Space Fund, and pay other fees into the OCII's Citywide Affordable Housing Fund to construct affordable housing on-site and, for any parcels adjacent to or facing the new Transit Center and its ramp structures, provide active ground-floor uses and direct pedestrian access from these areas to the ramps around the Transit Center.



Source: TJPA 2014

Figure 2-1 Approved Transbay Program

Together, these three major components were collectively identified as the approved Transbay Program. In April 2004, the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Final Environmental Impact Statement/Environmental Impact Report (2004 FEIS/EIR) (SCH #95063004) was certified by the City and County of San Francisco (City), the Peninsula Corridor Joint Powers Board, and the former San Francisco Redevelopment Agency, which determined that the 2004 FEIS/EIR satisfied the requirements of CEQA and enabled the local agencies to approve the project. The FTA issued a Record of Decision (ROD) for the 2004 FEIS/EIR in February 2005, which determined that the 2004 FEIS/EIR satisfied the requirements of NEPA and signaled FTA's approval of the project.

2.1.2 Approved Modifications to the Transbay Program (2006 – 2011)

Since approval of the Transbay Program in 2004, a number of changes have been made to its components. Transit Center and other transportation-related modifications have been initiated by the TJPA and the Federal Railroad Administration (FRA). These project changes, which were approved between 2006 and 2011, and other milestones are highlighted below.

TJPA Modifications

The TJPA Board of Directors adopted six addenda to the 2004 FEIS/EIR to provide environmental clearance under CEQA for modifications and refinements to the Transbay Program. The modifications and refinements to the Transbay Program evaluated in the six addenda were also each reviewed and approved by the FTA pursuant to NEPA and 23 CFR 771.130. The changes that were environmentally cleared by these addenda collectively modify the original approved Transbay Program, and are summarized as follows:

- **First Addendum.** The first addendum evaluated modifications to Phase 1 of the Transbay Program. The first addendum created a two-stage construction process for the Transit Center component and evaluated modifications and refinements to the Transit Center design and construction staging and revisions to the Temporary Terminal site plan. Phase 1 of the Transbay Program consists of construction of the Transit Center and the below-grade train box that accommodates the DTX tracks, station, and ancillary facilities. Phase 2 consists of construction of the DTX, the throat structure (i.e., the structure providing the connection between the underground tracks and the train box below the Transit Center), and tail tracks (i.e., tracks used for storage and light maintenance when the trains are not in revenue service). The first addendum was adopted by the TJPA Board of Directors on June 2, 2006.

- **Second Addendum.** The second addendum evaluated modifications and refinements to Phase 2 of the Transbay Program, design provisions to allow future construction of a Townsend/ Embarcadero/Main Loop and delay of the construction of the tail tracks on Main Street pending the outcome of future rail planning studies to accommodate HSR. The modifications considered in the second addendum reduced the size of various elements of the DTX and rearranged uses within the Transbay Program area. The second addendum was adopted by the TJPA Board of Directors on April 17, 2007.

- **Third Addendum.** The third addendum evaluated adding 546 Howard Street, which was identified in the 2004 FEIS/EIR for partial acquisition, to the list of properties identified for full acquisition under Phase 1. The entire property was determined to be needed for construction staging for the Transit Center project. The third addendum was adopted by the TJPA Board of Directors on January 17, 2008.

- **Fourth Addendum.** The fourth addendum evaluated the Temporary Terminal configuration, boarding platforms and waiting areas, bus staging areas, and street design for Phase 1 of the Transbay Program. The fourth addendum was adopted by the TJPA Board of Directors on October 17, 2008.

- **Fifth Addendum.** The fifth addendum evaluated the building design for the Transit Center, specifically the exterior façade of the upper levels, a pedestrian bridge over Beale Street, and associated public right-of-way vacations for Phase 1. The fifth addendum was adopted by the TJPA Board of Directors on April 9, 2009.

- **Sixth Addendum.** The sixth addendum evaluated refinements to the design and configuration of the Fremont Street bus ramp component of Phase 1 of the Transbay Program, which provides the transition from the Bay Bridge (Interstate 80) to the bus ramps leading to the Transit Center. The approved design includes three new refinements: a cable-stayed ramp connecting the bus ramps with the Transit Center, widening the bus exit off the Fremont Street ramp from westbound Interstate 80, and modifying the bus ramp footprint on the western side of the Transit Center to meet design and performance criteria. The sixth addendum was adopted by the TJPA Board of Directors on December 8, 2011.

FRA Modifications (2010)

In 2010, the FRA prepared a reevaluation of the 2004 FEIS/EIR to consider modifications to the train box design under Phase 1 and to update environmental information contained in the 2004 FEIS/EIR pursuant to FRA's Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999) (FRA 2010). This reevaluation consisted of four main components:

- updating the analysis associated with slightly widening the train box compared to that described in the 2004 FEIS/EIR (including method and staging of construction);

- updating high-speed train ridership projections based on 2009 forecasts from the California High-Speed Rail Authority (CHSRA);

- reevaluating elements of the environmental analyses in the 2004 FEIS/EIR that are pertinent to providing HSR service at the Transit Center, specifically air quality, greenhouse gas emissions, transportation and circulation, noise and vibration, construction impacts, and cumulative impacts of HSR service; and

- updating the financial analysis in the 2004 FEIS/EIR.

The FRA concluded that the project modifications and updated information would not result in significant environmental impacts that were not previously evaluated in the 2004 FEIS/EIR (FRA 2010). The FRA did not identify new information or circumstances relevant to environmental concerns that would result in significant environmental impacts not previously evaluated in the 2004 FEIS/EIR. Based on the revaluation, the FRA determined that the 2004 FEIS/EIR remained adequate, accurate, and valid to support the proposed project. However, the 2010 reevaluation acknowledged that the construction of the DTX component under Phase 2 of the Transbay Program would require modifications to the track curvature in the throat structure and an increase in the tangent length of the HSR rail platforms in accordance with the CHSRA design criteria and to provide sufficient capacity for HSR service.

The FRA issued a ROD in 2010 adopting the portions of the 2004 FEIS/EIR relating to Phase 1 of the Transbay Program for the purpose of FRA funding of the train box under the High-Speed Intercity Passenger Rail Program that would serve both Caltrain and HSR.

2.1.3 Land Use Modifications to the Transbay Program Redevelopment Area (2012)

In 2006, the City initiated a major planning effort to examine development opportunities in the vicinity of the new Transit Center. The intent of the resulting Transit Center District Plan (TCDP) was to investigate whether building densities and heights could be increased in recognition of the transit investment, and whether such growth could be leveraged to generate substantial new revenues to help fund the full Transit Center project. The plan that was approved by the City on August 8, 2012 allows for height-limit increases in subareas composed of multiple parcels or blocks within the TCDP area and in much of the Transbay Program redevelopment project area that was approved in 2004.

2.2 DESCRIPTION OF THE PROJECT ALTERNATIVES

Two alternatives are evaluated in this SEIS/EIR. The No Action Alternative consists of the previously approved Transbay Program, as amended through 2012. The description of the No Action Alternative focuses on the elements of the approved Transbay Program that relate to Phase 2; Phase 1 is already under construction. These Phase 2 elements are what will be constructed by the TJPA if the proposed project is not approved. The second alternative is the proposed project, which consists of proposed refinements to Phase 2 of the approved Transbay Program and other transportation-related improvements in the Transbay Program area. In addition to these transportation-related changes to the approved Transbay Program, development opportunities have been identified to support the development goals and needs of the City and the Office of Community Investment and Infrastructure. Importantly, these development opportunities are *not* part of the proposed project for NEPA purposes, because the FTA, the federal lead agency, would not be involved in funding or approving local land use changes. However, these development opportunities are part of the proposed project for CEQA purposes, because the TJPA and the City are collaborating to support and enable this development. The alternatives are described in detail in this section, below.

2.2.1 No Action Alternative (Approved Transbay Program Phase 2)

The No Action Alternative refers to the improvements that will be constructed in the absence of the proposed project (see Figure 2-1). In other words, if the currently proposed project is not approved, the previously approved Transbay Program Phase 2 still will be constructed. Thus, the No Action Alternative is the approved Transbay Program, as subsequently modified between 2005 and 2011 by the TJPA and FRA. In addition, the future land use, urban design, open space, and local transportation network surrounding the Transit Center will be as defined in the TCDP and Redevelopment Plan. Aspects of the No Action Alternative as it relates to Phase 2 of the Transbay Program are discussed below.

DTX Alignment

Alignment and Facilities

The length of the DTX from the existing terminus and railyard to the Transit Center is approximately 2 miles.[3] The DTX extends from Seventh Street and Mission Bay Drive (formerly Common Street) at its

[3] The total project length is 2 miles from the western end of the Caltrain railyard to the eastern end of the train box. In some instances throughout the document, a length of 1.3 miles is cited. The 1.3 miles is the length of the DTX from the Fourth and King Station to the Transit Center.

westerly end, which is also the western boundary of the existing Caltrain railyard and Fourth and King Street Station (see Figure 2-1), to Beale Street underneath the Transit Center at its easterly end.

Under the No Action Alternative, a station beneath Townsend Street between Fourth and Fifth Streets will be constructed for trains that will continue on to the Transit Center. This station will be north of the existing at-grade Caltrain terminus station under the existing Caltrain railyard and Townsend Street. The existing Fourth and King Streets terminus station will continue to function as a Caltrain terminal and storage and maintenance facility. To transition between the at-grade tracks south of the station and railyard and the new underground station, a U-shaped retaining wall cut open at the top (also referred to as a "U-wall") will be constructed. The No Action Alternative does not include further improvements to the Fourth and King Street surface facilities, but does not preclude such improvements by others as a separate project.

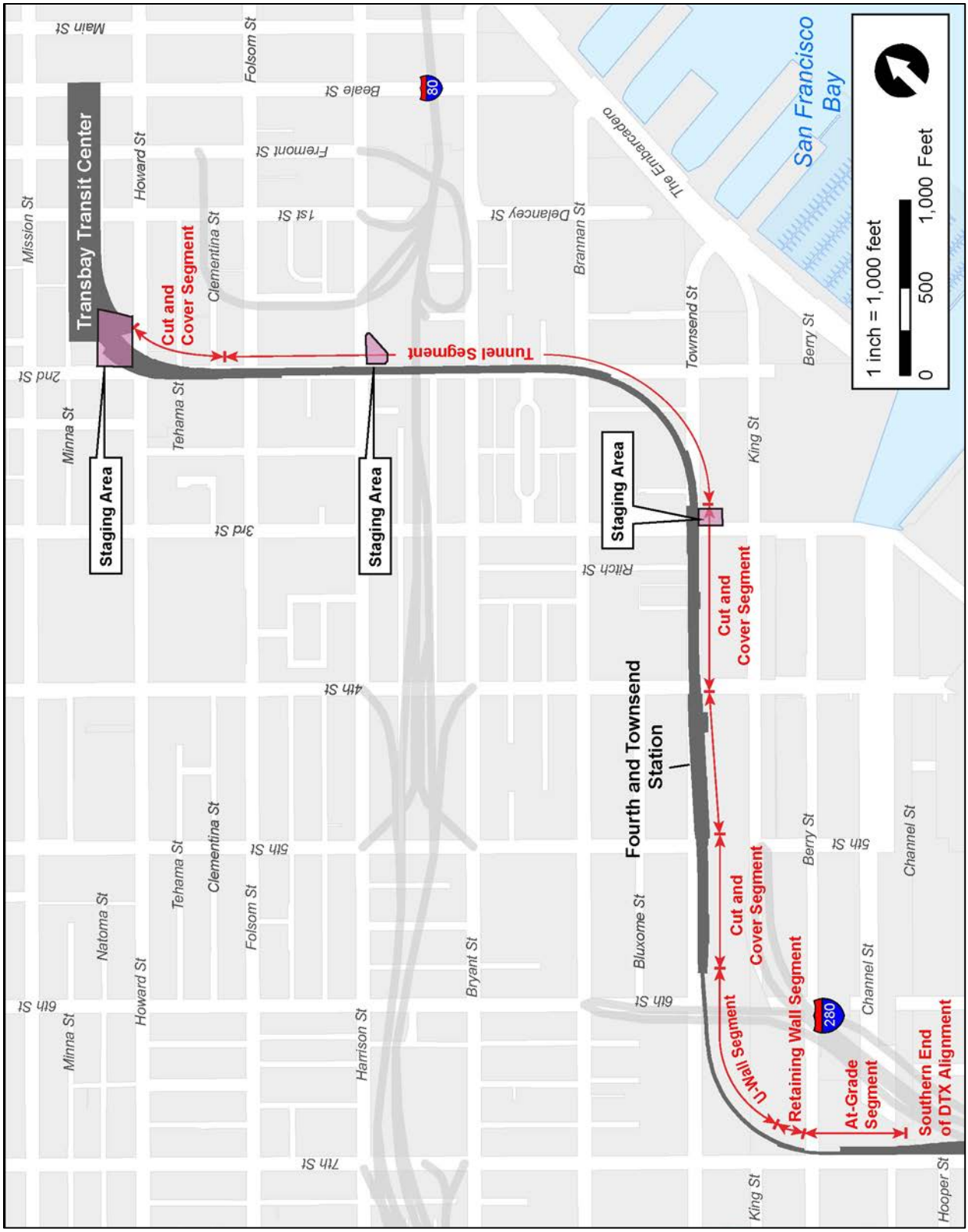
From the new underground Caltrain station, three tracks will continue east under Townsend Street. The alignment will curve north at about Clarence Place just east of Third Street, and extend to Second Street where it will head north. Through this approximately 1,100-foot curve, the DTX will pass under a number of low-rise structures in the block bounded by Third, Second, Townsend, and Brannan Streets. North of Brannan Street, the alignment will run under Second Street for approximately 0.4 mile, to a point between Clementina and Tehama Streets, where it will turn eastward along an approximately 970-foot curve toward the Transit Center. In this segment of the alignment, the DTX will pass under a number of low- and mid-rise buildings between Tehama and Natoma Streets and from Second Street eastward for approximately 200 feet.

As the three-track system enters the throat structure to connect to the train box in the lower levels of the Transit Center, it will split to six tracks to accommodate the three loading platforms within the Transit Center. The eastern end of the train box at Beale Street represents the eastern project limits. The original plans approved in 2004 called for extension of tail tracks southward from the train box along Main Street; however, this extension was deferred in 2007 pending the outcome of later studies for HSR service, and has since been determined to be unnecessary.

DTX Construction Methods

The underground DTX will be constructed using cut-and-cover techniques through the existing Caltrain railyard and along Townsend Street; mined tunnel methods along Second Street under Rincon Hill between Townsend and Folsom Streets, with cut-and-cover sections north and south of the tunneled section; and cut-and-cover techniques for the throat structure (see Figure 2-2).

Cut-and-Cover Construction. Cut-and-cover construction techniques can vary from "bottom up" to "top down" to "semi-top-down." All of these techniques are commonly used, and the eventual choice will depend on site constraints at the time of construction, the traffic management plan approved by the City, shoring systems, construction schedule, and contractor's preference. Typically, the bottom-up method completes the excavation, after the temporary shoring walls are constructed, from street level all the way down to the floor of the permanent structure. Temporary longitudinal walers and transverse struts will be installed as the excavation progresses deeper to prevent movement of soil outside of the two shoring walls. Construction of the permanent structure will start with the base slab, then progress upward toward the surface: up along the side walls, the intermediate floors (if any), the side walls again, and finally the roof slab. In areas where traffic decking is deployed to facilitate surface traffic while allowing excavation to continue below the street, the decking supporting beams will be adopted as the first layer of struts.



Source: TJPA 2010a

Figure 2-2 Approved Transbay Program Phase 2 - DTX Alignment and Construction Method

Tunnel Construction. Because the geology in the tunnel section is fractured rock and not suitable for standard tunnel boring machines, the TJPA proposes to use a "stacked drift" approach to reduce the risk for tunnel collapse or failure. The stacked drift method involves mining a series of interconnected tunnel drifts in a certain sequence. ("Drift" is a general mining term that refers to any opening in a mine or tunnel that is a near-horizontal passageway; in soft ground for long tunnels, multiple drifts can be excavated preceding the tunneling.) The drifts are supported with concrete and connect to form a structural arch. Construction of the arch is followed by removal of the core beneath the arch. By limiting the unsupported span of the drifts to a relatively small span (typically approximately 10 feet), this tunneling method provides advantages for excavation of a large tunnel in difficult ground conditions.

DTX Design Criteria

Construction and design of the DTX will comply with the DTX Design Criteria (TJPA, PMPC 2009). The DTX Design Criteria identifies applicable codes, standards, and engineering criteria to provide a uniform basis and framework for the DTX design. The current edition of the regulation at the time of notice to proceed for final design of the DTX shall apply and be incorporated into plan drawings and construction contracts. These criteria also apply to the design of facilities not owned by the TJPA, but constructed as part of the scope of the DTX. Incorporated into the DTX Design Criteria are the following specific rail operation requirements: Caltrain Engineering Standards, Peninsula Corridor Joint Powers Board Design Criteria Manual – Electrification Program, and CHSRA Engineering Design Criteria. In addition, the criteria reference relevant federal and state regulations (e.g., the California Health and Safety Code and the California Public Utilities Commission General Orders governing train operational safety), the California Building Code, and applicable City codes (e.g., the City Municipal Code, City regulations for working in San Francisco streets, and City regulations for dust generation and control).

Each of the chapters in the DTX Design Criteria includes specific requirements for each of the principal disciplines of the DTX design. Key chapters that contain specifications and guidelines to avoid or minimize potential environmental effects are highlighted below.

Chapter 3 – System Safety and Security – provides the system safety management, reliability assurance, and safety certification requirements and specific design criteria for project security.

Chapter 5 – Civil Design – provides the design criteria for general civil designs, including survey control, roadways, storm drainage, and requirements for maintenance and protection of traffic during project construction.

Chapter 6 – Utilities – provides the criteria for the design of new utilities, utility relocations, replacements, and abandonment.

Chapter 9 – Geotechnical Requirements – provides the design criteria for geotechnical exploration, testing, and analysis.

Chapter 10 – Protection of Existing Infrastructure – provides design criteria and requirements for protection through temporary support and/or underpinning of existing facilities, including buildings, highway structures, utilities, and other infrastructure adjacent to or affected by construction.

Chapter 11 – Structures – provides design criteria for temporary and permanent structures, including support of excavation, retaining walls, retained cut structures (boat sections), and cut-and-cover structures, including stations, bridges, buildings, and miscellaneous structures. The design criteria include material properties and structure loading and durability requirements.

Chapter 12 – Tunnels – provides design criteria for temporary and permanent structures for mined tunnels, including initial support, initial lining, and final lining. The design criteria include material properties and structure loading requirements.

Chapter 13 – Seismic Design – sets forth the criteria for seismic design of permanent and temporary structures.

Chapter 16 – Communications – provides design criteria for project communications systems, including the communication backbone network requirements and project systems requirements for passenger amenities, security, and supervisory control and data acquisition.

Chapter 19 – Corrosion Control – provides design criteria for corrosion control, including stray current, soil, and water, and atmospheric corrosion control, including protective requirements and material selection.

Chapter 20 – Architecture – provides architectural and site development design criteria for project facilities, including the Fourth and Townsend Street Station, Fourth and King Street Station, and Caltrain railyard. Design criteria for the stations include platform geometry, passenger circulation criteria, sizing of public and non-public spaces, employee equipment and office room layouts, materials and finishes, and site development requirements.

Chapter 22 – Fire-Life Safety – provides design criteria for fire-life safety systems, including fire detection, alarm and suppression systems, emergency lighting and tunnel ventilation, and fire fighter air systems. Also includes requirements for emergency egress and exit signage.

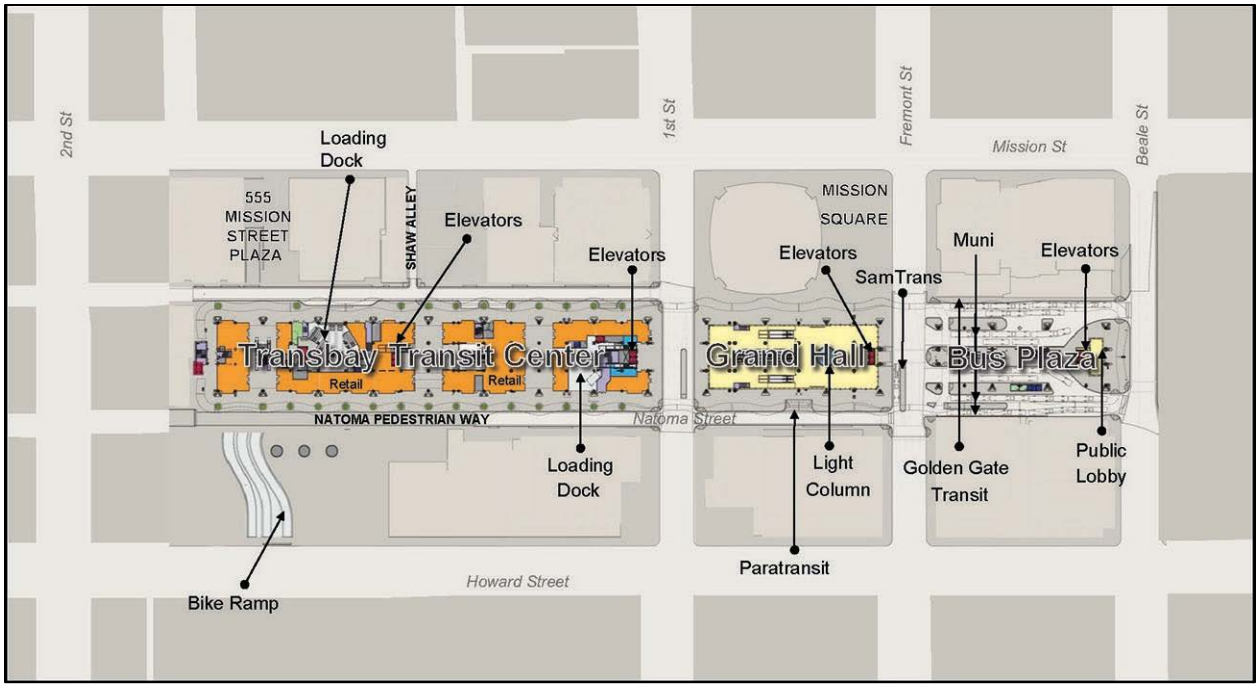
Chapter 23 – Mechanical Systems – provides design criteria for the mechanical design of facilities, including station and ancillary facility ventilation and temperature control, elevators and escalators, and plumbing and drainage systems.

Chapter 24 – Electrical Systems – presents the design criteria for electrical design of all DTX facilities, including requirements for materials and performance standards, electrical equipment and wiring, lighting, and grounding and power for tunnel operating systems (with the exception of traction electrification and high-voltage services).

These chapters contain data and design parameters that must be achieved in the DTX design, which ensures compliance with the applicable standards, codes, and guidelines. Specific federal, state, and City regulations and codes and industry standards (current as of 2009) are incorporated by reference into the DTX Design Criteria.

Transit Center and Train Box

The Transit Center currently under construction as Phase 1 of the Transbay Program will serve as a regional transit hub connecting 11 transportation systems, including public and private bus services, Caltrain, and future HSR services. The "Grand Central Station of the West" will encompass more than 1 million square feet within a complex extending from just south of Mission Street to between Second Street on the west and Beale Street on the east (see Figure 2-3a). The above-grade portion of the Transit Center and the train box will be completed in 2017. Uses and functions to operate the Transit Center will be completed during Phase 1, and uses and functions to support rail service will be completed as part of Phase 2. The five-level Transit Center will house two below-ground levels in the train box and three above-ground levels (see Figure 2-3b):



Source: TJPA 2013a

Figure 2-3a Transit Center Plan View at Ground Level

Source: TJPA 2013a

Figure 2-3b Transit Center Cross Section

- The Train Platform level of the Transit Center will be two levels below-ground and contain three passenger platforms that will accommodate six train tracks for Caltrain and HSR.

- The next level up, the Lower Concourse level, will provide a passenger connection between the street level above and the train platforms below. The Lower Concourse level will contain retail, ticketing, and bike storage areas.

- At the Ground level, the Transit Center will feature the Grand Hall where passengers can use the public information center, ticket kiosks, automated ticketing booths, and the main escalators to access trains below and buses above. At the western end of the Transit Center along Natoma Street, space for service and maintenance and a loading dock will be included. At the eastern end, between Fremont and Beale Streets, an outdoor bus plaza will serve Muni, Golden Gate Transit, and SamTrans.

- The floor above the Ground level is the Bus Deck level that will serve AC Transit and private bus operators such as Greyhound. The bus deck is designed as a loop that will surround a central passenger waiting area. At the western end of the Transit Center, the Bus Deck level will connect to the bus ramps that will provide direct access from Interstate 80.

- A 5.4-acre rooftop public park (City Park), approximately 70 feet above street level, will offer a variety of amenities, such as an open air amphitheater, gardens, trails, open grass areas, and children's play space, as well as a restaurant and café.

The lower two levels, including the passenger platforms and the Lower Concourse, are being jointly constructed as a "train box." Approximately 60 feet below-ground, the train box is 1,500 feet long by approximately 190 feet wide. Construction of the train box as part of Phase 1 of the Transbay Program was made possible in 2010 when the FRA provided up to $400 million of American Recovery and Reinvestment Act funds to the TJPA. Constructed of reinforced concrete, the train box extends easterly to the east side of Beale Street, with future provisions for tail tracks pending further studies by the CHSRA. Where the tracks narrow (from six tracks to three) at the west end of the train box to connect to the rail tunnel, just east of Second Street, the train box will accommodate the utility, signal, and control systems needed for Caltrain and HSR service. The structure where the tracks will narrow at the west end of the train box is referred to as the throat structure, which will be constructed as part of Phase 2.

Ancillary Facilities

The No Action Alternative includes ventilation and emergency shafts for the tunnel portion of the DTX and at each end of underground stations. Initial sites were generally identified, but locations are subject to change as design advances.

Ventilation Shafts. During normal conditions, tunnel ventilation is achieved by natural ventilation consisting primarily of train piston-action induced airflows. Fans within the ventilation shafts augment the train piston action during normal operations and provide the primary means of limiting high tunnel temperatures when the train piston-action-induced airflows are not present. In emergencies, the ventilation systems can be operated for smoke control and discharge, and augmented through remote overriding fan controls. Under the approved Transbay Program, ventilation shafts would be located at each end of the Transit Center and one ventilation shaft would be located at the Fourth and Townsend Street Station.

Emergency Shafts and Exits. The TJPA will comply with and implement National Fire Protection Association (NFPA) Standard 130, which requires emergency or exit shafts to the surface at least every

2,500 feet. Where practical, the ventilation shafts may include emergency stairways, enabling ventilation and emergency shafts to be co-located. The No Action Alternative includes emergency shafts at each end of the Transit Center, at Second and Brannan Streets, and at Second and Howard Streets. The shafts are proposed to be constructed as part of the cut-and-cover or tunnel construction, as applicable.

Emergency Generators. A diesel-powered emergency generator will be located at the ventilation shafts to operate critical functions (e.g., emergency lighting, fans). The generators need to be tested, typically at 1-month intervals, so noise mitigation will be provided.

Operating Plan / Service Assumptions

The 2004 FEIS/EIR has a future horizon year of 2020. At the time the 2004 FEIS/EIR was prepared, it was assumed that Caltrain would operate 132 daily trains in 2020, including 34 trains in both directions for the 3-hour AM period and another 34 trains for the 3-hour PM period.

The HSR service assumptions were updated in 2010 as part of the FRA reevaluation. The service assumptions were equivalent to approximately 8 trains per hour into and from the Transit Center during the morning and evening peak periods of 3 hours each, and approximately 6 trains per hour into and from the Transit Center during the remaining 10 off-peak hours of operation.

Both Caltrain and the California High-Speed Rail Authority have since issued documents that provide updated service plans and ridership forecasts, including the Caltrain Peninsula Corridor Electrification Project (PCEP) EIR and the California High-Speed Rail Authority's 2014 Business Plan (see additional information in Section 2.3, Operations). The service assumptions continue to reflect a shared use by the two operators ("blended" operations), as described in more detail in a memorandum of understanding (MOU) between the operators of Caltrain and the HSR service (CHSRA 2012). To implement the blended system approach, a number of upgrades would need to occur to accommodate the mixed traffic capacity requirements of HSR and commuter services (CHSRA 2012). Two essential projects were identified for an initial investment strategy that would provide the groundwork for the blended operations to progress, the Corridor Electrification Infrastructure Project and Advanced Signal System. The MOU identified and adopted funding plans to move these two essential projects that are needed to secure the benefits of the blended system forward, and required CHSRA to reflect the MOU in its 2012 Business Plan.

The blended system envisions up to 10 trains per peak hour per direction to and from San Francisco. The 10 trains per peak hour for the blended operations assume a service level of six Caltrain trains per peak hour per direction (tpph/d) and four HSR tpph/d. More precise numbers of Caltrain or HSR trains that could proceed all the way to the Transit Center, and the associated ridership, would be determined in the future, based on the final platform and track design at the Transit Center and the service plans of the operators.

Other Transportation System Improvements

In addition to the Transit Center and the DTX, other transportation improvements were previously approved as part of the Transbay Program. Key elements of the No Action Alternative are identified below (see also Figure 2-1).

Underground Pedestrian Connector

The No Action Alternative includes a pedestrian connection under Fremont Street from the Lower Concourse level of the Transit Center to the Embarcadero BART/Muni Metro Station along Market Street. The underground pedestrian connector will be approximately 800 feet long.

Off-Site Bus Storage

AC Transit bus storage will be provided at-grade under the Bay Bridge approaches between Second and Third Streets. Access to the storage area will be via Fourth Street and a two-way "storage link" that will connect with the Transit Center bus ramps. A neighboring Golden Gate Transit bus storage facility will also be located under the Bay Bridge approaches between Third and Fourth Streets. Evening and weekend use of the Golden Gate Transit lot is recognized as a possibility, but no such consideration is made for the AC Transit lot.

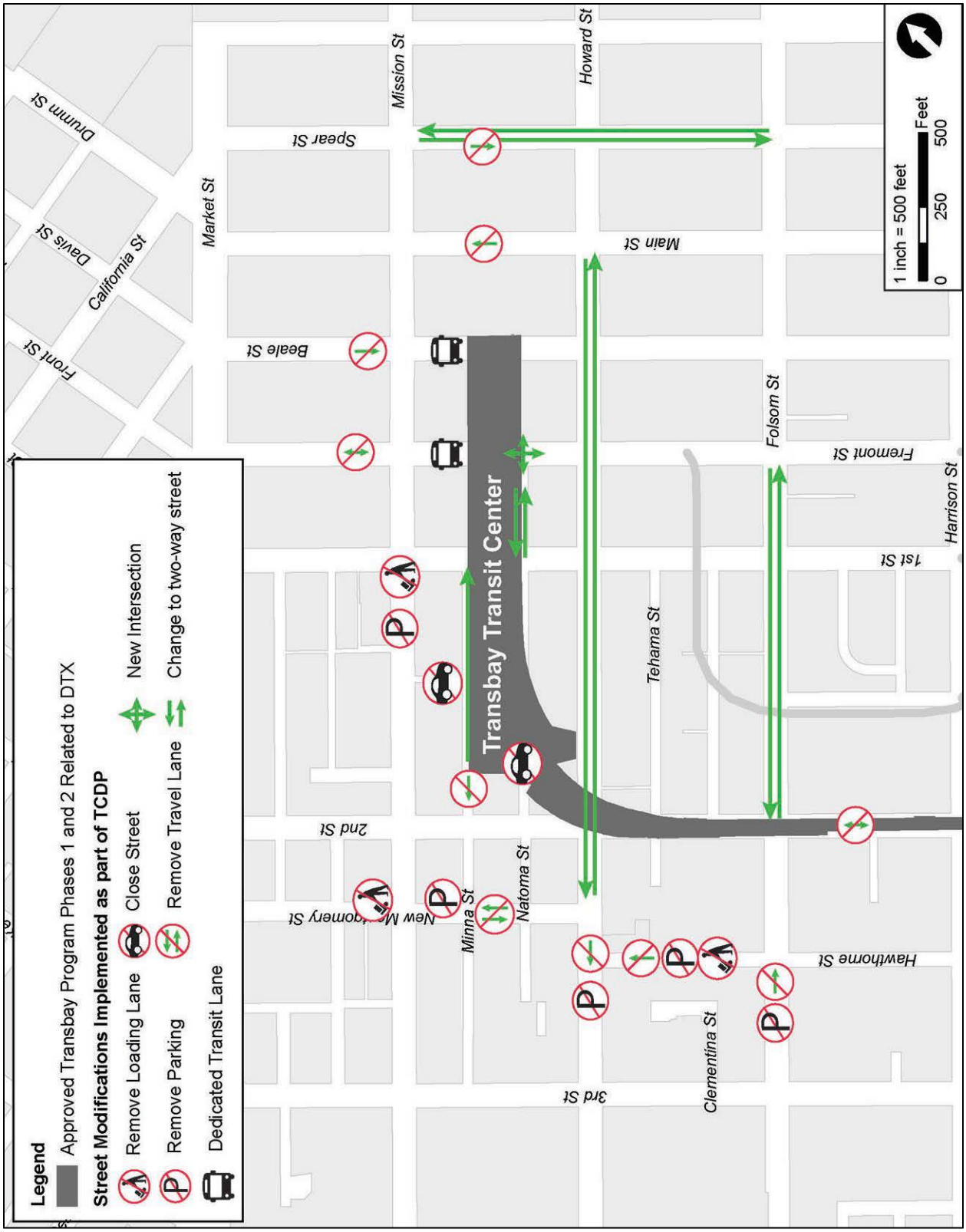
Greyhound Service and Other Private Operators

The originally approved Transit Center plans accommodated Greyhound and other private bus operators on an upper-level bus deck 60 feet above street level; a second bus deck was proposed for AC Transit. This was subsequently revised in 2006 as part of the First Addendum, when Greyhound operations were relocated to the Lower Concourse level, which will be constructed one level below the street level and one level above the train platforms. Other bus operators that were proposed for the upper-level bus deck will be consolidated on the AC Transit level, now referred to as the Bus Deck level, above the Ground level and below the City Park.

Street Modifications

To accommodate increased vehicular, pedestrian, and bicycle activity and enhance access to the Transit Center and regional connections, the previously approved plans identify a number of revisions to the local streets serving the Transbay Program. Relevant modifications (particularly travel lane configurations) identified in the TCDP that relate to or will be affected by the Transbay Program are listed below and shown in Figure 2-4.

- Remove parking and loading lanes on both sides of Mission Street.
- Convert Howard Street to two-way operations between Fremont Street to New Montgomery Street, between Main and Fremont Streets, and between First and Second Streets.
- Remove one automobile travel lane and one parking lane on Howard Street between Second and Third Streets.
- Convert Folsom Street to two-way operations from Fremont Street to Second Street.
- Remove one automobile travel lane and one parking lane on Folsom Street west of Second Street, and continue one-way operations.
- Remove one automobile travel lane and one parking/loading lane on Hawthorne Street between Howard and Folsom Streets.
- Eliminate parking and loading on the east side of New Montgomery Street between Market and Howard Streets.
- Convert Second Street between Market and Harrison Streets to one vehicular travel lane and one bicycle lane in each direction (eliminate one automobile travel lane in each direction).
- Remove one automobile lane on Fremont Street between Market and Howard Streets and extend existing transit-only lane south to Howard Street.



Source: AECOM adapted from City of San Francisco in 2012

Figure 2-4 Street Modification from the Transit Center District Plan and Transbay Redevelopment

- Create new intersection on the east side of Fremont Street between Minna and Natoma Streets.
- Replace one southbound automobile travel lane along Beale Street between Market and Mission Street with a transit-only lane. Beale Street remains one-way in the southbound direction.
- Remove one automobile lane between Market and Folsom Streets on Main and Spear Streets.
- Convert Spear Street to two-way operations, with one lane in each direction.
- Permanently close Shaw Alley to vehicles and design as pedestrian-only space.
- Convert Minna Street from one-way westbound to one-way eastbound between First and Second Streets.
- Convert Natoma Street from Second Street east to midway between First and Second Streets to pedestrian access and emergency vehicles only, with a potential exception for delivery vehicles during certain non-peak periods. To the east, convert Natoma Street to two-way traffic from First Street to approximately 250 feet west of First Street.

Land Use Planning and Development

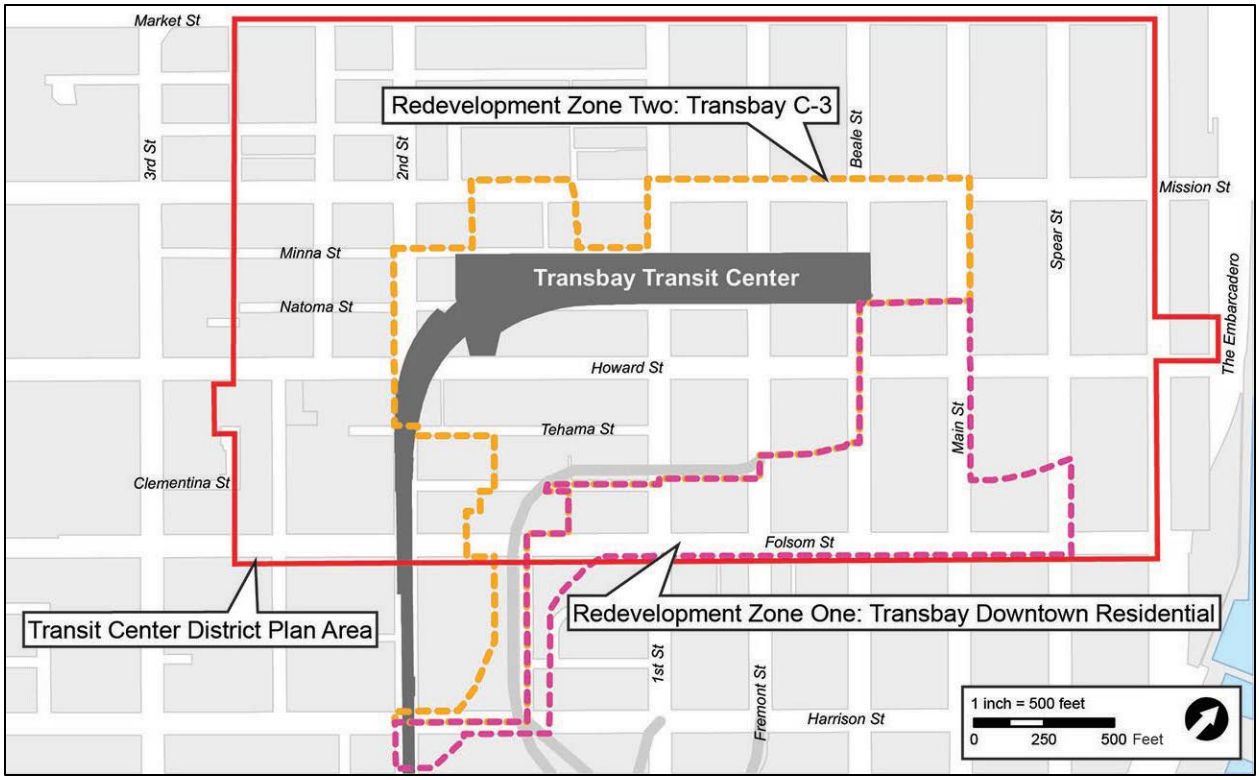
The intent of the TCDP is to plan for increased building densities and heights in a 145-acre area roughly bounded by Market Street, The Embarcadero, Folsom Street, and Hawthorne Street (see Figure 2-5) to help support the new Transit Center and to leverage the increased growth to generate substantial new revenues to help fund the full Transit Center project. The TCDP area includes most of the area covered by the Redevelopment Plan component of the Transbay Program. The TCDP was approved by the City on August 8, 2012. The TCDP establishes new planning policies and controls for land use; urban form, including building height and design; street network modifications/public realm improvements; historic preservation; and district sustainability, including enhancement of green building standards, among other features. The TCDP also allows for height-limit increases in subareas composed of multiple parcels or blocks within the TCDP area. The revised land use controls allows 6.35 additional million square feet of office space, 1,000 additional hotel rooms, 86,000 additional square feet of retail, and 1,300 additional residential units. With respect to the Transbay Program, the TCDP modified the land use controls on several blocks covered by the redevelopment portion of the LPA.

Summary of the No Action Alternative

The approved Transbay Program, which is the No Action Alternative for this SEIS/EIR, is summarized in Table 2-2.

2.2.2 Proposed Project

Subsequent to the Transbay Program evaluated in the 2004 FEIS/EIR and addenda (through 2011), additional changes that fall within three categories have been proposed: refinements to the DTX, other transportation improvements, and land development on certain sites not fully used for the proposed transportation facility (as explained previously, the first two sets of changes related to transportation comprise the proposed project for NEPA purposes, and all of the identified changes, including the land development proposals, comprise the proposed project for CEQA purposes). For purposes of CEQA, the City of San Francisco has requested that the TJPA evaluate the future land development at a conceptual level in this SEIS/EIR since any such development would occur on property currently controlled by the TJPA. Subsequently, after the TJPA sells the portion of the property not needed for the transportation improvements, any development approvals for the portion that is sold would be governed by the City of San



Source: AECOM adapted from City of San Francisco in 2012

Figure 2-5 Transit Center District Plan Area and Transbay Program Redevelopment Plan Area

Francisco's development entitlement and permitting processes, and the City would be the lead agency for the CEQA review. Since the land development component is a part of the proposed project only for CEQA purposes, the FTA has no responsibility under NEPA for CEQA compliance by either the TJPA at this stage or the City when development may occur. These components are summarized in Table 2-3 and shown in Figure 2-6. Some of the components were previously analyzed in the 2004 FEIS/EIR and addenda (described in Section 2.1.2, Approved Modifications to the Transbay Program); however, specific locations and features of the vent shafts/emergency exits, for example, have been defined and updated since that time and can now be evaluated in this SEIS/EIR.

The proposed project would not change the operating plan of the DTX or Transit Center. Operations would remain the same as under the No Action Alternative, most recently updated in the 2010 reevaluation by the FRA.

DTX Refinements

There are seven proposed refinements to the DTX under the proposed project. They involve modification of the throat structure, extension of the underground levels of the Transit Center train box from Beale Street eastward to Main Street, realignment of the underground Fourth and Townsend Street Station, construction of vent structures at specific locations, modifications at the Caltrain railyard at the western end of the proposed project limits, installation of rock dowels in conjunction with construction of the mined tunnel segment, and additional trackwork south of the Caltrain railyard.

Table 2-2
Chronology and Summary of the No Action Alternative (Approved Transbay Program)

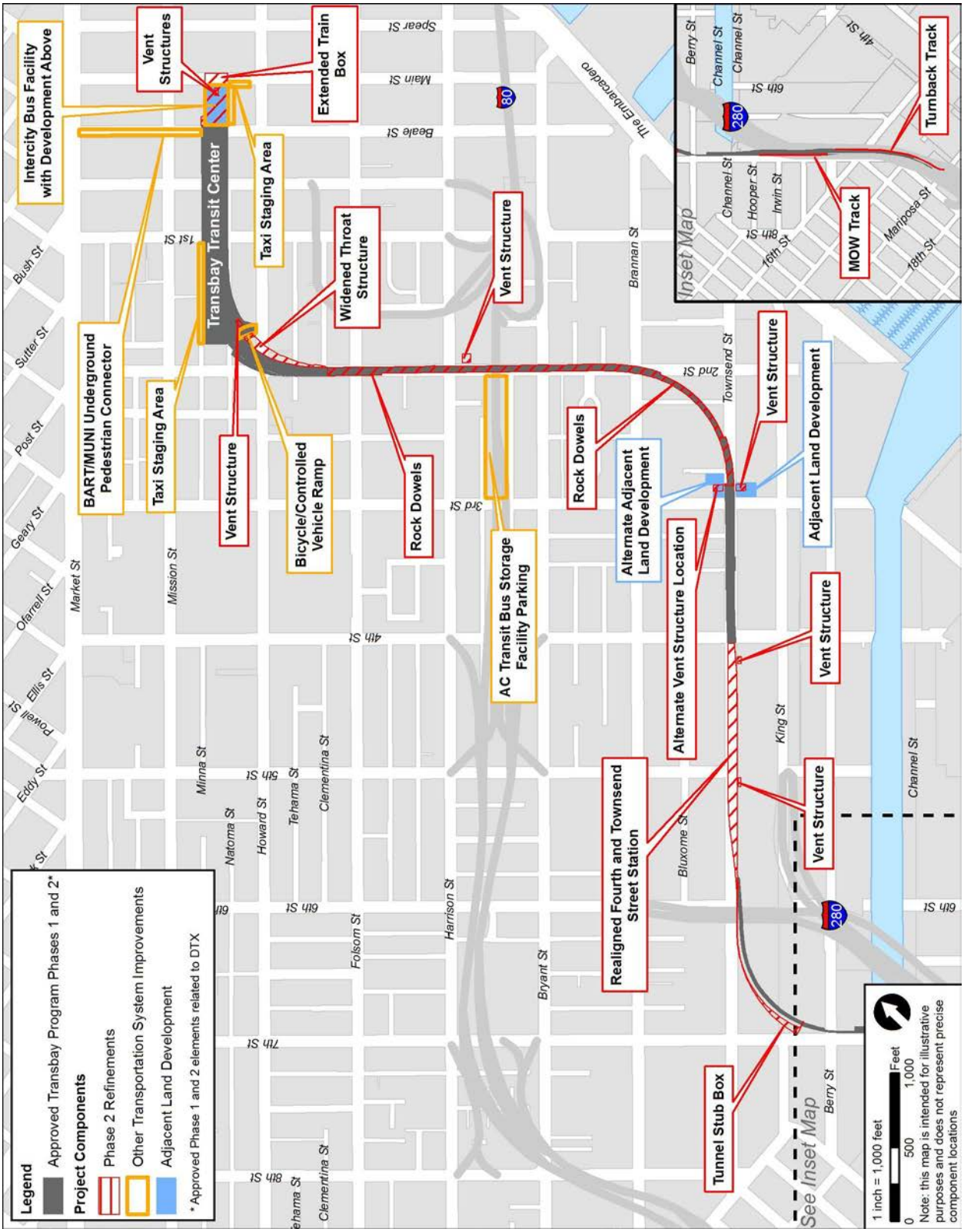
Year	Environmental Review	Approved 2004 Transbay Program	Refinements to the Transit Center Component of the 2004 Transbay Program	Refinements to the DTX Component of the 2004 Transbay Program
2004	Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project FEIS/EIR	• New Transit Center at First and Mission Streets and a Temporary Terminal during construction • Underground extension (Downtown Rail Extension or "DTX") from current terminus at Fourth and King Streets to a new underground terminus in the basement of the Transit Center • Adoption of the Redevelopment Plan for the Transbay Program project area	N/A	N/A
2006	First Addendum	• 109 feet to the roof height and 156 feet to the top of the cone-shaped roof element • Top level width at 165 feet • Lower Concourse and Ground level widths at 165 feet • Two-level, stacked bus ramp reaching a height of 60 feet above street level • Grid of 1,000 piles to support the Transit Center structure • All Transit Center components to be constructed simultaneously in one phase	Refinements to the Transit Center component: • Reduction in the building height and size to be determined in final design • Reduction in height that results in eliminating the top bus level originally planned to serve Greyhound and other carriers; AC Transit level will become the building's top level; suburban and charter bus operation displaced from the upper level will be consolidated on the AC Transit level • Top level width reduced from 165 to 155 feet • Lower Concourse and Ground level widths reduced from 165 feet to 110 feet • Relocation of Greyhound operations to the train mezzanine level (Lower Concourse) • Elimination of one level of bus ramp; resulting single-level bus ramp will be 40 feet above street level • Improvements in public access and pedestrian circulation at Ground level • Use of a temporary Greyhound boarding area prior to construction of the permanent boarding facility in Phase 2 • Use of a reduced number of piles for construction of the Transit Center (125 caissons to support the above-grade Transit Center, substituting for the 1,000 piles in the original LPA) • Transit Center construction to be split into two stages: (1) complete above-grade portion of the building and provide the structural supports, and (2) complete the underground train station and mezzanine level	N/A
2007	Second Addendum	• No design provisions to allow for future construction of a Townsend/Embarcadero/Main Loop • Three-track lead on the surface leading to the DTX tunnel system and merging into two tracks under the Fourth and Townsend Street Station • Underground rail car storage within the existing Caltrain rail storage yard • No design provisions to allow for future connection to the cut-and-cover tunnel on Townsend Street	N/A	• Design provisions to allow future construction of a Townsend/Embarcadero/Main Loop and delay in construction of tail tracks on Main Street pending outcome of future rail planning studies to accommodate HSR • Reduction in elements or rearrangement of the DTX component: - Two-track lead on the surface and below-ground leading to the DTX tunnel system just before the underground Fourth and Townsend Street Station - Three tracks beginning at the underground Fourth and Townsend Street Station and continuing to the throat section approaching the Transit Center where the three-track system splays to six tracks to accommodate the six platform berthing locations within the station - At-grade rail car storage within the existing Caltrain rail storage yard - Design provisions to allow for a future connection to the cut-and-cover tunnel on Townsend Street to facilitate construction of future system capacity for Caltrain and HSR, and capable of accommodating construction of the Townsend/Embarcadero/Main Loop - Delay in construction of tail tracks

Table 2-2
Chronology and Summary of the No Action Alternative (Approved Transbay Program)

Year	Environmental Review	Approved 2004 Transbay Program	Refinements to the Transit Center Component of the 2004 Transbay Program	Refinements to the DTX Component of the 2004 Transbay Program
2008	Third Addendum	• Partial acquisition of 546 Howard Street	• Full acquisition of 546 Howard Street	N/A
2008	Fourth Addendum	• Two temporary surface terminals: on Folsom Street between Fremont and Beale Streets for Greyhound buses, and on block bounded by Beale, Howard, Main, and Folsom Streets for AC Transit buses • Facilities and passenger waiting areas for Greyhound and AC Transit bus services at perimeter of the blocks • Golden Gate Transit allocated three bays on the curb with an additional four to five layover spaces on the north side of Folsom Street between Fremont and Beale Streets • SamTrans express to operate via Mission, Beale, Folsom, and Main Streets to an endpoint at Beale Street between Howard and Folsom Street or on Main Street between Folsom and Howard Streets • Muni located on the curbs surrounding the temporary terminal block	• Consolidation of Temporary Terminal facilities on a single block, bounded by Folsom, Main, Howard, and Beale Streets • Incorporation of boarding facilities and passenger waiting areas for Greyhound and AC Transit bus services into the interior of the block • Reconfiguration of the boarding and staging areas for the other bus operators around the perimeter of the block and adjacent blocks - SamTrans and Golden Gate Transit have separate staging areas on the east side of Main Street with shared boarding area/passenger shelter on sidewalk along Main Street near Howard Street - Muni allotted stops along the east side of Main Street north of Howard Street and the west side of Beale Street, and a boarding island on Beale Street just south of Howard Street; Muni shares the west side of Beale Street with carpool pick-up • Modifications to the bus lane configuration on the surrounding street that include (1) adding eastbound bus lanes on Howard Street, (2) modifying bus lanes on Beale Street to allow travel in both southbound and northbound directions between Howard and Folsom Streets, and (3) redesigning Beale Street immediately north of Howard Street to accommodate two bus lanes on the east side of the street and one lane on the west side with traffic confined to the two center lanes	N/A
2009	Fifth Addendum	• No above-ground outer wall basket structures • No pedestrian bridge over Beale Street	• Addition of above-ground outer wall basket structures • Possible addition of a pedestrian bridge over Beale Street • Vacate additional public right-of-way for areas that need to be occupied by the Transit Center because of these minor changes in design: - Air space for the Transit Center outer wall basket structures over Minna, Natoma, and Beale Streets - Air space for the proposed pedestrian bridge over Beale Street - Air space for the Transit Center bus deck bridges over First and Fremont Streets - Below-ground for the train boxes under Minna, Natoma, First, and Fremont Streets - Air space for the bus ramps connecting the Transit Center to Interstate 80 where the bus ramps cross over Natoma, Howard, Tehama, Clementina, Folsom, First, and Harrison Streets	N/A
2011	Sixth Addendum	• Program-level evaluation of bus ramps because project specifics could not be identified in advance of project-level design	• Cable-stayed ramp connecting the bus ramps with the Transit Center • Widening the existing 12-foot-wide, single-lane bus exit off the Fremont Street ramp from westbound Interstate 80 by an additional 12 feet • Modifying the bus ramp footprint on the western side of the Transit Center	N/A
2010	2004 FEIS/EIR Reevaluation	• 1,500 feet long by 190 feet wide train box • Based on 2020 HSR ridership projections	• Update analysis associated with slightly widened train box (by approximately 18 to 25 feet) • Update HSR ridership projections based on 2009 projections from CHSRA, which extend to 2035 • Update financial analysis	N/A

Table 2-3
Proposed Project Components

DTX Refinements
• Modification of widened throat structure entering the west side of the below-grade levels of the Transit Center and related property acquisitions to accommodate HSR trains and to reduce track and wheel maintenance and noise from wheel squeal.
• Extension of the underground levels of the Transit Center (the train box) eastward to Main Street to accommodate 400-meter, fully tangent platforms for HSR service. Level boarding is planned for the Transit Center; details regarding platform height are under discussion among TJPA, Caltrain, and HSR and would be determined outside the environmental process. Implementation of the extended train box would require demolition of the back (south portion) of the 201 Mission Street office tower and the relocation of existing above- and below-grade facilities of that building.
• Realignment and lowering the profile of the underground Fourth and Townsend Street Station, adding a mezzanine at the station, and lengthening the tunnel.
• Construction of vent structures (emergency ventilation/smoke evacuation structures co-located with emergency tunnel exits) at both ends of the underground Caltrain Fourth and Townsend Street Station, at Third and Townsend Streets, at the southeastern corner of Second and Harrison Streets, and at both ends of the train box in the Transit Center. Also, construction of two exhaust fans at the west end of the Transit Center adjacent to the proposed vent structure and extending from below up to the street level. This refinement includes both new facilities not previously evaluated as well as facilities that have been relocated from the sites previously evaluated.
• Minor relocation of lead tracks to the railyard to maintain access to the current Fourth and King Street Station and enable construction of a below-grade tunnel stub box under the already approved U-wall to expedite future arrival of below-grade Caltrain and HSR.
• Preservation of six at-grade platforms (12 tracks) at the Caltrain railyard as currently configured, rather than three at-grade platforms (six tracks) in the southern portion of the railyard.
• Installation of rock “dowels” primarily along Second Street during construction of the mined tunnel to reduce ground movements around the tunnel and protect adjacent properties. This component may require underground easements.
• Additional trackwork south of the railyard (a turnback track and maintenance of way (MOW) storage track) within the existing Caltrain right-of-way between Hooper Street and Mariposa Street, immediately east of Seventh Street.
Other Transportation System Improvements
• An intercity bus facility to provide regional and airport bus and shuttle services above the train box extension between Beale and Main Streets. The intercity bus facility would serve Amtrak and private bus operators such as Greyhound.
• Taxi staging area at curbside along portions of Minna, Natoma, and Main Streets.
• A bicycle/controlled vehicle ramp from Howard Street north to the Transit Center and below-grade bicycle facilities.
• Use of the AC Transit bus storage facility on Third Street between Perry and Stillman Streets for special event and nighttime public parking.
• An alternative replacement alignment in Beale Street for an Embarcadero BART/Muni Metro underground pedestrian connector to the Embarcadero Station.
Adjacent Land Development under CEQA*
• Above the intercity bus facility, two floors of office, totaling 45,000 square feet, or 128 residential units.
• At the vent structure site at 701 Third Street (at Townsend Street), 76,000 square feet of mixed uses, consisting of a 4,000-square-foot restaurant and either 72,000 square feet of office or 72 residential units. At the alternate site at the northeast corner of Third and Townsend Streets, 72,000 square feet of professional offices or other commercial space consistent with City zoning regulations.
Note:
* The adjacent land development is not under FTA’s jurisdiction, and, thus, it is not considered to be part of the NEPA action. Under NEPA, future development of these sites to include additional land uses besides the transportation improvements is considered a secondary or indirect effect. The adjacent land development has been included in this table, because it is part of the CEQA project description.
Source: Compiled by TJPA and AECOM in 2013

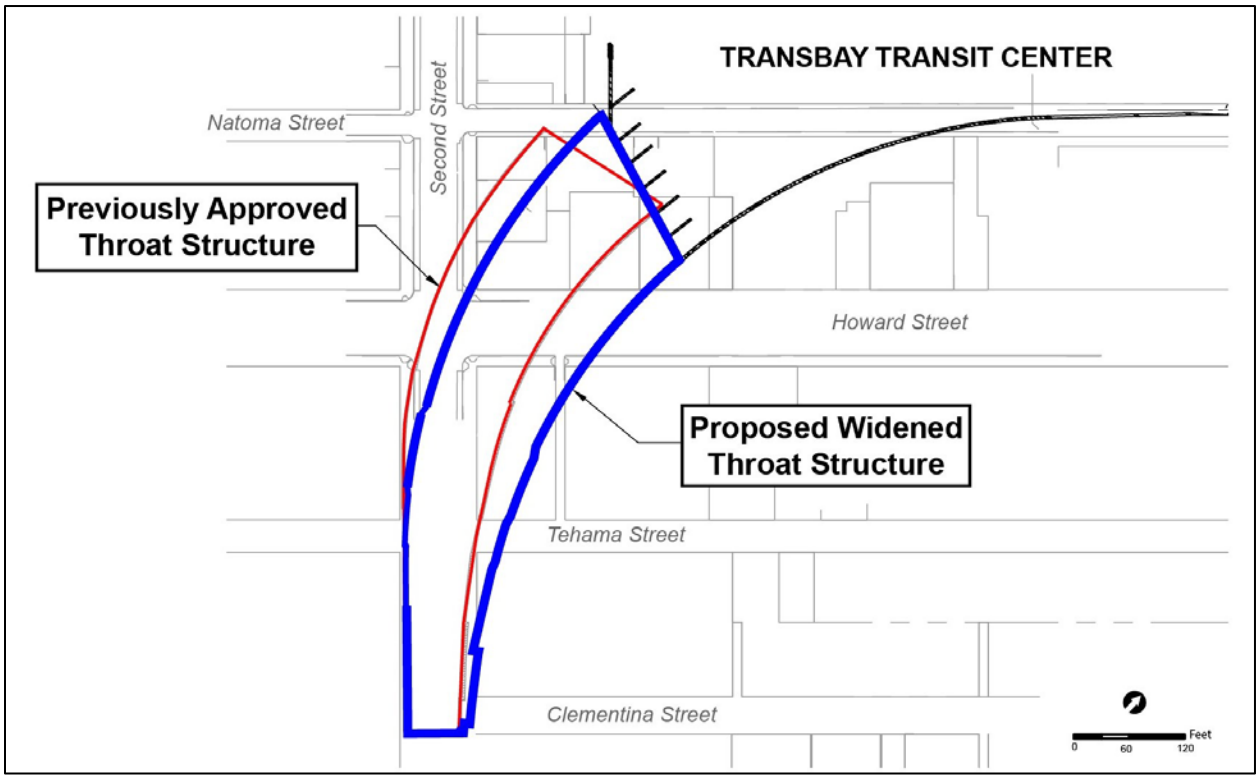


Sources: City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 2-6 Proposed Project Components [Refinements to the Approved Transbay Program]

Widened Throat Structure

The proposed project would widen the throat structure on the northeast side of the DTX alignment entering the west side of the Transit Center (TJPA 2011a). The previously approved throat structure at the southwest corner of the Transit Center occupies 64,610 square feet. The proposed project would widen the throat structure eastward and increase the footprint of the throat structure by 14,059 square feet, for a total area of 78,669 square feet (see Figure 2-7). This increased area is proposed to comply with updated design specifications that were released by the CHSRA in 2010 regarding track curvature and platform design. The widened throat structure is needed to accommodate changes to the track curvature that is desired to reduce track and wheel maintenance and noise from wheel squeal that can occur as trains travel over tight curves. The proposed project would enable a minimum 650-foot curve radius, an increase from the previously approved DTX track curve radii of 498 to 545 feet.



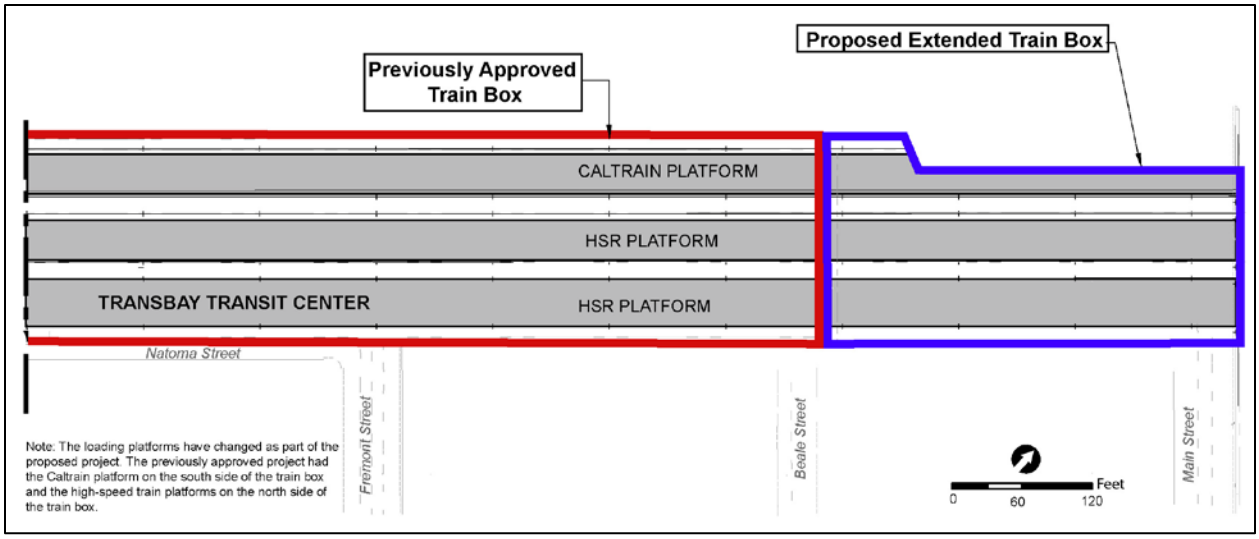
Source: TJPA 2013b

Figure 2-7 Previously Approved and Proposed Widened Throat Structure

Extended Train Box

The proposed project would extend the underground levels of the Transit Center (train box) eastward into Main Street to enable fully tangent tracks of 1,355 feet, at a minimum, for HSR trains. Caltrain, by contrast, requires a minimum 800-foot platform length. The previously approved DTX train box terminates at Beale Street. The proposed project would extend the Lower Concourse and Train Platform levels by one block, from Beale Street to Main Street (Figure 2-8).

This extension makes the new design compatible with CHSRA design standards; the current approved design would not satisfy these standards and, thus, would not enable HSR service (TJPA 2011a). As seen in Figure 2-8, the HSR trains would occupy the four southerly tracks, and Caltrain would occupy the two northerly tracks. Constructing the Transit Center train box extension would require removal of the above-grade podium structure at 201 Mission Street. The shorter Caltrain tangent tracks and loading platform on



Source: TJPA 2012a

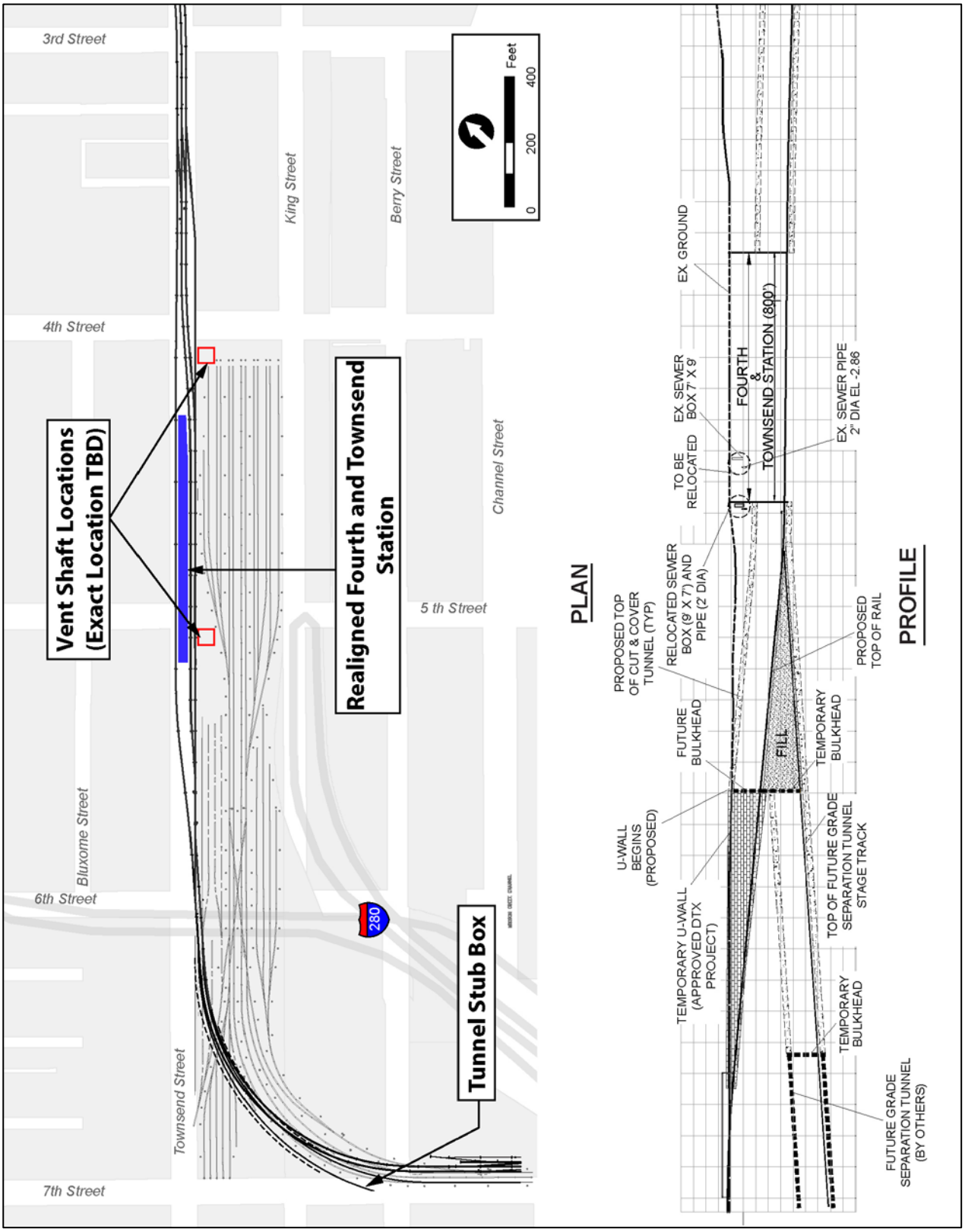
Figure 2-8 Previously Approved and Proposed Train Box

the north side of the train box would avoid conflicts with the foundations of the 201 Mission Street office tower. Development of an intercity bus facility above the extended train box is discussed separately under "Other Transportation Improvements," below.

Realigned Fourth and Townsend Street Station

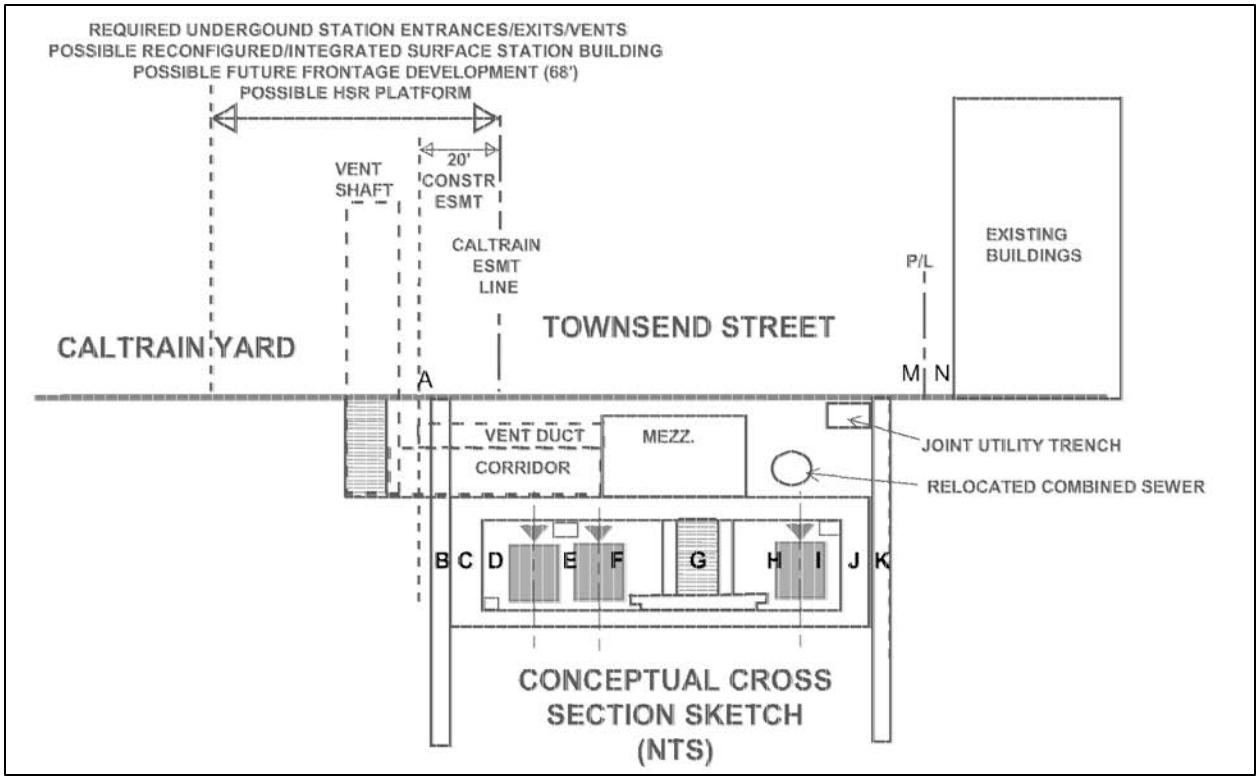
For the proposed project, the underground station at Fourth and Townsend Streets would be lowered and realigned along and underneath Townsend Street, a mezzanine added, and the tunnel lengthened. The realignment would shift the station slightly north from the previously approved DTX station plan and profile, which is partially under the Caltrain railyard and partially under Townsend Street (see Figure 2-9a). The realignment of the Fourth and Townsend Street Station as part of the proposed project would not affect the use of the existing at-grade tracks and station area at Fourth and King Streets for an interim HSR terminal station, if needed. The lowered profile (as shown in Figure 2-9b) would provide space for a mezzanine and would reduce relocation impacts on the City's combined sewer system.

This new alignment would incorporate the City's desire to accommodate possible future development at the existing railyard, improve Caltrain operations to the Transit Center, and enhance passenger orientation and wayfinding. The City is exploring the potential for either reconfiguring or replacing the existing Fourth and King Street Station, to allow potential redevelopment of the site for housing and employment in the area. The City's ongoing study, entitled the Railyard Alternatives and I-280 Boulevard Feasibility Study, would evaluate removing the end of the I-280 freeway, extending Caltrain and HSR tracks underground, creating a surface boulevard and allowing the reconnection of adjacent neighborhoods at the Fourth and King Street Station, and potentially redeveloping the Fourth and King Street Station. At the time of this SEIS/EIR's publication, the City study has not been completed; a Phase I feasibility assessment of options is underway and Phase II alternatives development is planned. Significant discussion is needed to determine the feasibility and potential design and removal of I-280 and construction of the high-speed rail network before the project's effects on the transportation system in Mission Bay can be understood. Funding has not been secured to study options beyond a Phase II alternatives development, or to undertake or implement any aspect of this project; thus the project is speculative and not reasonably foreseeable (SF OCII 2015). As a result, any future development at this site remains at the conceptual planning phase, is not included in any adopted plan, and would be the subject of separate environmental review by Caltrain or the City and County of San Francisco, as appropriate.



Source: Parsons Transportation Group 2014a

Figure 2-9a Realigned Fourth and Townsend Street Station – Plan and Profile



Source: Parsons Transportation Group 2014a

Figure 2-9b Realigned Fourth and Townsend Street Station – Cross Section

Vent Structures

Construction of the DTX would require installation of emergency ventilation/smoke evacuation structures co-located with emergency tunnel exits when possible (collectively referred to as vent structures). As described in the introduction to Section 2.2.1, the 2004 FEIS/EIR evaluated potential impacts from ventilation shafts and emergency exit shafts; however, the locations changed as the design advanced. Under the proposed project, specific locations and detailed engineering of these emergency structures have been identified as follows:

- Realigned underground Fourth and Townsend Street Station – one at the west end of the station at Fifth Street on the south side of Townsend Street and one at the east end of the station at Fourth Street on the south side of the Townsend Street. Each of these vent shafts would extend approximately 35 feet above street level. One vent shaft was proposed as part of the approved Transbay Program; the second vent shaft would be needed because of the proposed change to the station profile.

- Third and Townsend Streets – this vent structure would be sited in the northeast quadrant of a 13,750-square-foot parcel at 701 Third Street; an alternate location across Townsend Street at 699 Third Street and 180 Townsend Street is also under consideration. An approximately two-story structure (about 18 feet tall), occupying a footprint of approximately 3,600 square feet, would front onto Townsend Street under the 701 Third Street site option and would be set back away from Townsend in the northeast portion of the 699 Third Street site option. An exhaust air shaft, an intake air shaft, and the vent shaft would all extend upward from the roof of the two-story structure. The air shafts would be approximately 35 feet above street level, and the vent shaft would be approximately 105 feet above the street level for the 701 Third Street site option and approximately 95 feet above street level for the 699 Third Street site option.

- Second and Harrison Streets – this vent structure would be sited in the southwestern portion of this 13,750-square-foot parcel at the corner of Second and Harrison Streets. An approximately two-story structure (approximately 18 feet tall), occupying a footprint of approximately 3,600 square feet, would front onto Second Street. The vent shaft would extend upward from the roof of this structure to approximately 101 feet above the street level.

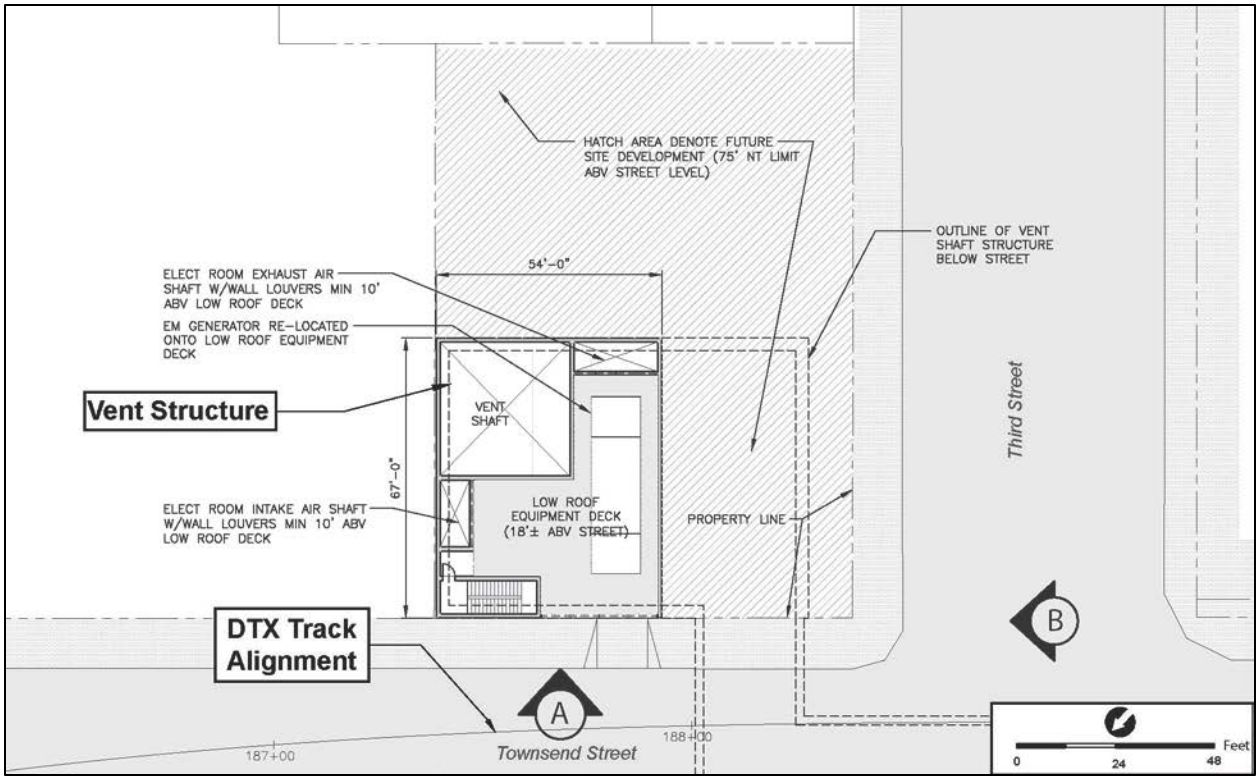
- Transit Center – at the west end of the train box, a ventilation structure, including two vent shafts and a cooling tower, would be constructed. This shaft, approximately 14 feet in diameter, would be a minimum of 12 feet tall above street level, depending on whether it would be integrated with future land development at this site. Two additional vents for exhaust fans, immediately east of the cooling tower under construction, would be needed for the DTX operations. These exhaust fans would be constructed to street level and covered until needed. When DTX service commences, these exhaust fans would be uncovered and become operational. They would not protrude above the street level. All three of these new vent structures would be located within the footprint of the train box that was previously cleared in the 2004 FEIS/EIR.

  A fourth vent structure would be constructed at the east end of the Transit Center in the vicinity of Natoma and Main Streets. This facility, including the emergency exits, would be integrated into the design of the proposed intercity bus facility (see below under "Other Transportation Improvements" for additional information). The vent shaft and emergency exits would be within the building envelope of the bus facility that would be 40 feet above street level and located along the wing of the building along Main Street.

Each of the vent structures would contain a shaft, electrical room, fan room, emergency generator, and stairway, which would tie into the DTX tunnel. Figures 2-10a, 2-10b, 2-11a and 2-11b depict the plans and cross sections of the ventilation shaft/emergency structures at the Third and Townsend Streets and Second and Harrison Streets, respectively. The vent structures would serve to exchange air, moving fresh air underground and removing stale air. In the event of an emergency such as a fire, the reversible fans would enable smoke to be removed from underground facilities; passengers would be evacuated from the tunnel via the emergency structure stairways. According to the DTX Design Criteria, above-grade vent structure exteriors may require specific design features such as contextual materials to be compatible with new development or existing adjacent buildings. The street-level design and appearance of ventilation structures would be coordinated with the City of San Francisco Planning Department.

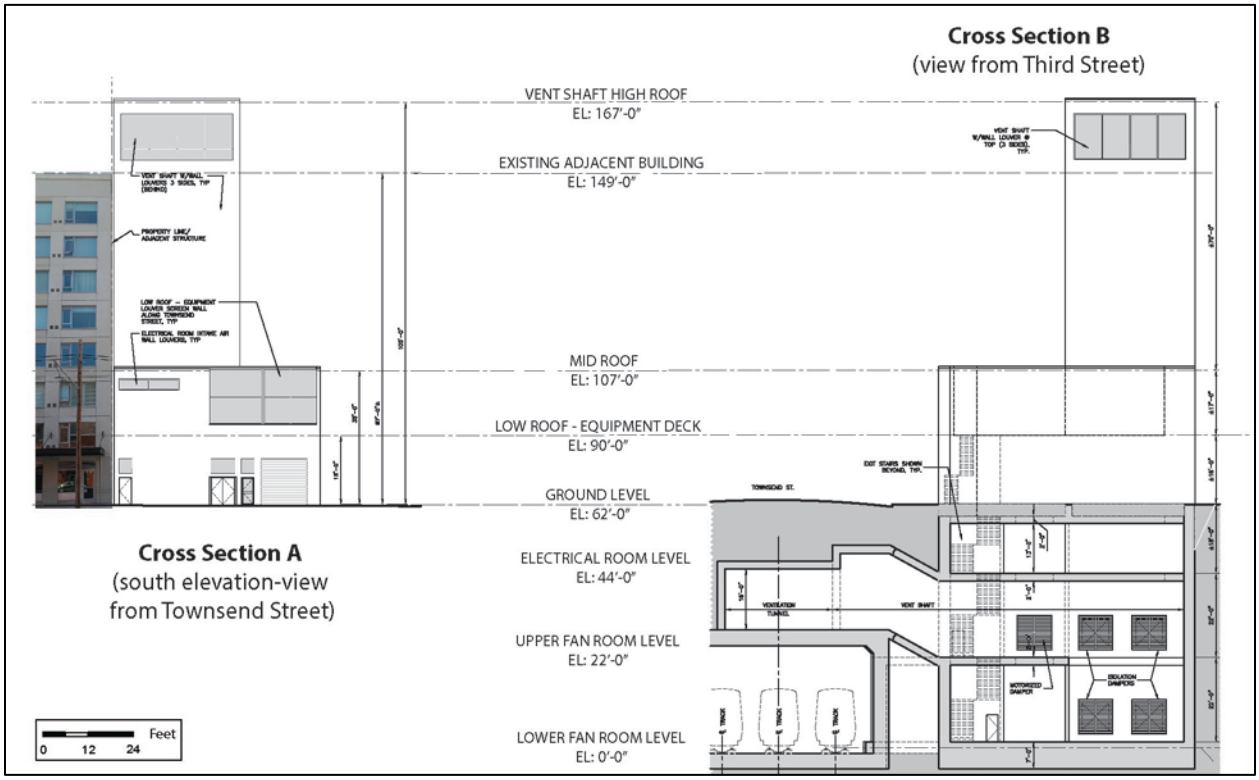
A number of technical requirements govern the location and placement of the above-ground vent shafts and louvers located within the shafts. Key requirements from the NFPA, the California Mechanical Code, and the DTX Design Criteria are as follows:

- Sufficient exit capacity must be provided to permit the evacuation of station occupants from platforms in 4 minutes or less.
- Evacuation also must be provided from the most remote point on a platform to a point of safety in 6 minutes or less.
- A maximum of 2,500 foot spacing between emergency or exit shafts to the surface.
- Outside air exhaust/intake openings shall be located at least 10 feet from lot lines or buildings on the same lot.
- Louvers shall be at least 10 feet above-grade or the sidewalk level.
- Outdoor intakes shall be located at least 25 feet from exhaust outlets.



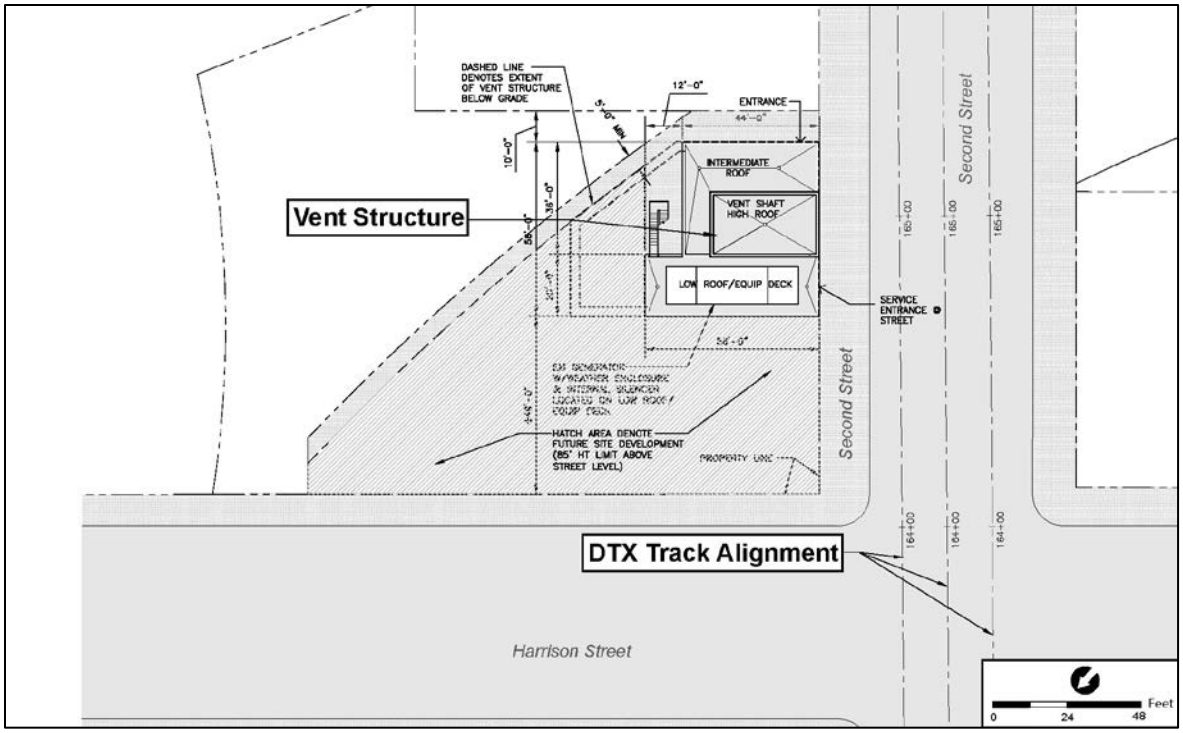
Source: Parsons Transportation Group 2014b

Figure 2-10a Vent Structure at 701 Third Street – Plan View



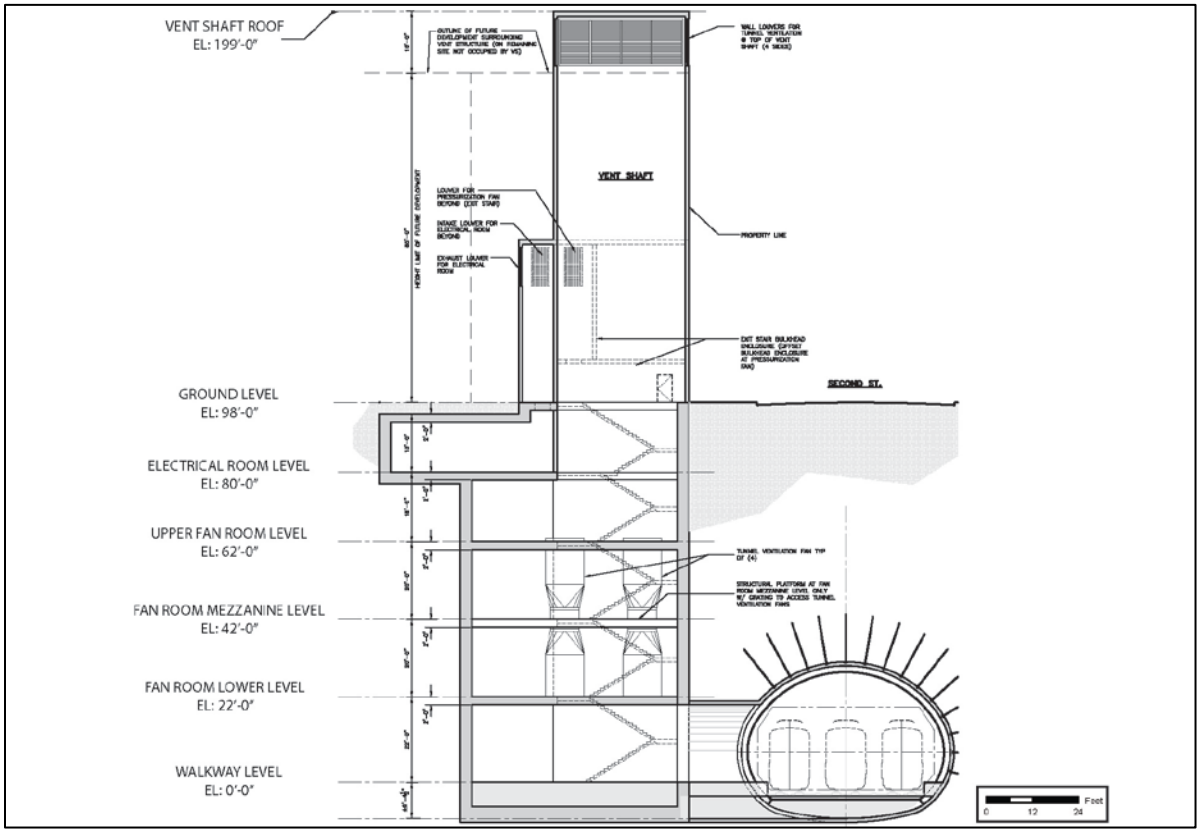
Source: Parsons Transportation Group 2014b

Figure 2-10b Vent Structure at 701 Third Street – Cross Section



Source: Parsons Transportation Group 2014c

Figure 2-11a Vent Structure at Second and Harrison Streets – Plan View



Source: Parsons Transportation Group 2014c

Figure 2-11b Vent Structure at Second and Harrison Streets – Cross Section

The vent structures would be designed to comply with and allow implementation of the NFPA 130 standards, the California Mechanical Code, the DTX Design Criteria, and TJPA assessments of risk and vulnerability from various threats.

Tunnel Stub Box

The proposed project would involve modifications at the west end of the railyard located south of Townsend Street between Sixth and Seventh Streets (Figure 2-6 and Figures 2-12a and 2-12b). The refinements would construct a below-grade train box segment at the west end of the railyard beneath the already approved U-wall to expedite future below-grade Caltrain and HSR service, and to preserve future options regarding grade separations.

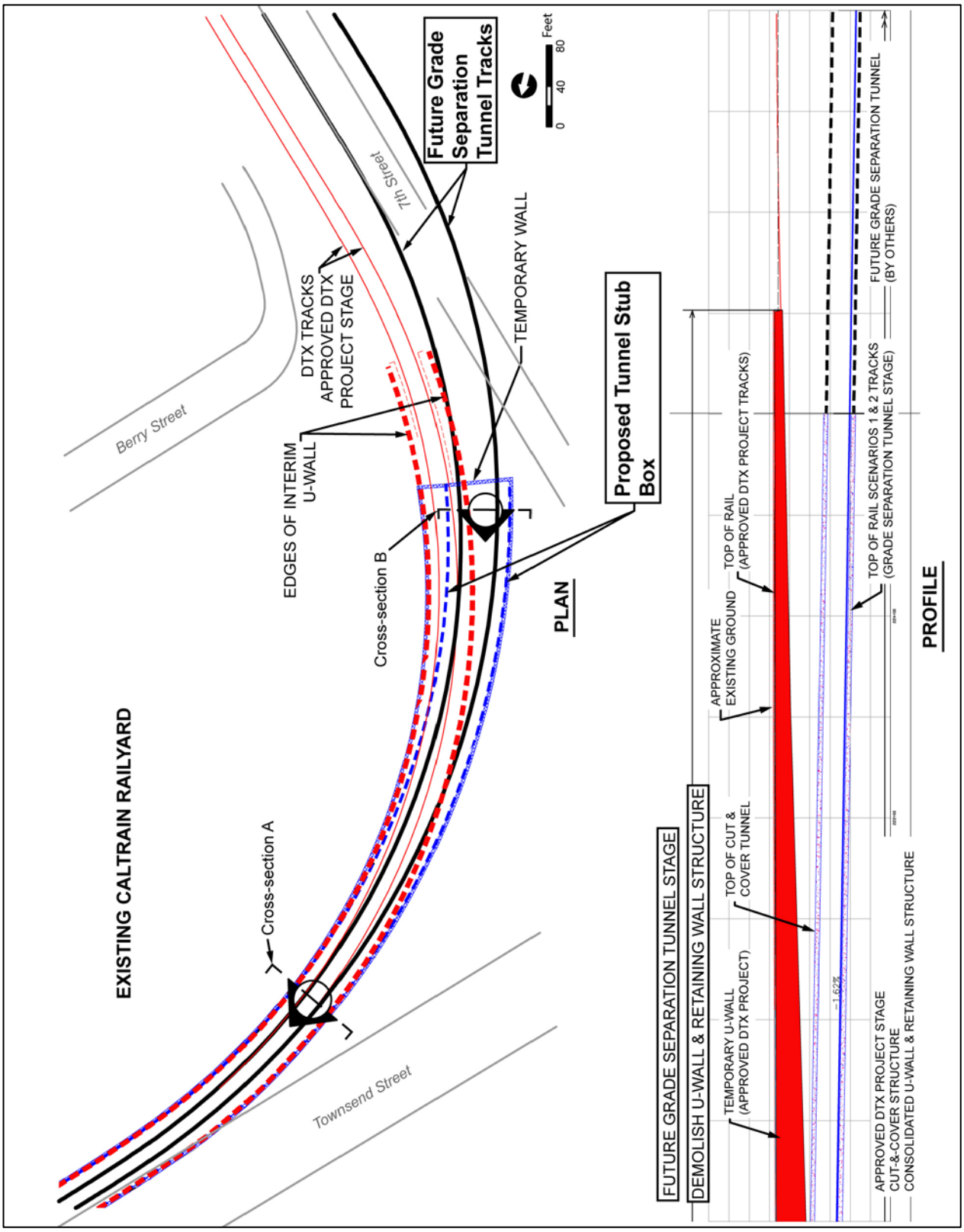
As shown in blue in Figure 2-12a, a retained cut/U-wall is already approved as part of the Transbay Program to transition trains travelling at-grade to the lower elevation of the below-grade station at Fourth and Townsend Streets. A possible future connection from a tunnel from the south to the underground Fourth and Townsend Street Station is being considered by the TJPA and its regional partners. This would require constructing a new train box segment (36 to 48 feet wide) under the U-wall to expedite future Caltrain and HSR service (see cross sections in Figures 2-12b). Some depth would be added for construction of the U-wall area, but would otherwise not change DTX construction. The additional underground construction beyond the horizontal limits of the retained cut/U-wall already proposed is shown in red in Figure 2-12a. When grade-separated intersections farther south on the Caltrain alignment (a separate project not part of the proposed project) are constructed, the upper deck of the U-wall portion could be demolished and the lower train-box level could be outfitted with tracks, signaling, and other required elements. The tunnel stub box would not preclude service to existing Caltrain stations.

Rock Dowels

Construction of the mined tunnel from the Townsend Street curvature and along Second Street would require installation of rock dowels to temporarily support the tunnel (see Figure 2-13). Rock dowels are high-strength steel reinforcing bars installed into holes drilled around tunnel perimeters and grouted into place with non-shrink grout (i.e., cement, water, and additives). After the grout sets up or hardens, the dowels can be tensioned to support the rock mass around the tunnel. In addition, the dowels are able to stabilize blocks of rock around the tunnel that might fall out into the tunnel if no support is provided. Providing such support elements would reduce ground movements around the tunnel and protect adjacent properties affected by creation of the tunnel opening. The rock dowels could extend beyond the public right-of-way and, thus may require easements from property owners on either side of the tunnel. The need for easements from adjacent property owners was not identified as part of the project in the 2004 FEIS/EIR or subsequent addenda. Because of the depth of the DTX tunnel (60 to 100 feet below the surface), no conflicts are anticipated to occur between the rock dowels and the foundations or basements of adjacent buildings.

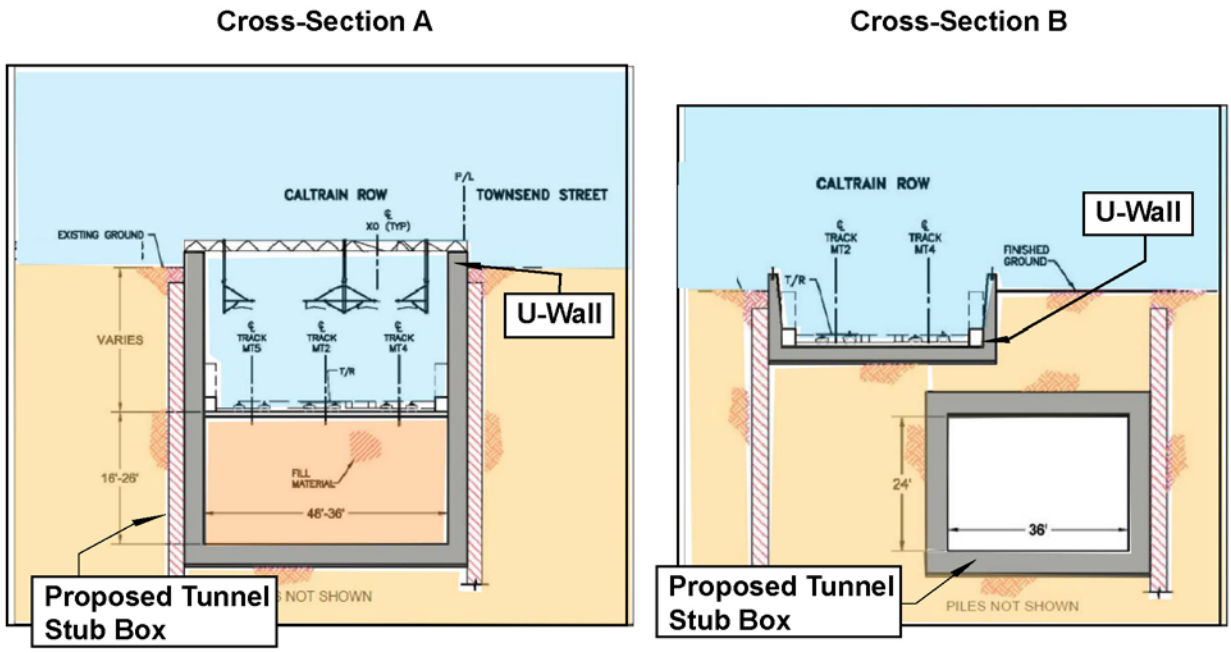
Additional Trackwork South of the Railyard

The proposed project would include additional trackwork in the existing Caltrain right-of-way, south of Caltrain railyard and along Seventh Street (see Figure 2-14). The first improvement would be a turnback track, which would be required for Caltrain to move trains between the Caltrain railyard and the Transbay Transit Center when not in use or when maintenance is required. Trains would be moved to the Caltrain railyard, and the turnback track would be needed for this movement. The turnback track would be constructed at-grade on the east side of the existing mainline tracks from Hubbell Street on the north, extending southward for approximately 1,400 feet under the elevated Interstate 280 freeway across 16th Street, and terminating at Mariposa Street. Trains from the Caltrain railyard would travel south along the track lead, onto the mainline track, and onto the turnback track (at Hubbell Street). Trains would continue



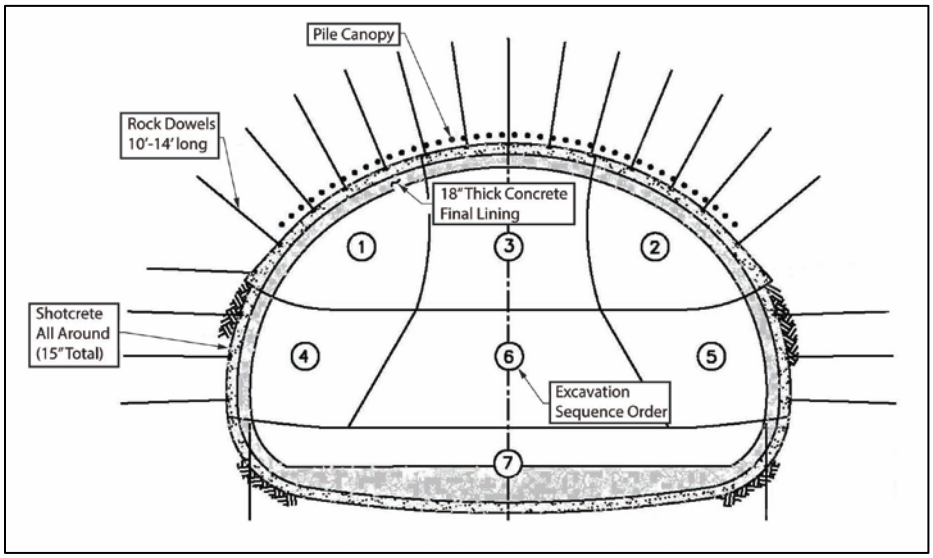
Source: TJPA 2013c

Figure 2-12a Tunnel Stub Box at Caltrain Railyard – Plan and Profile



Source: TJPA 2013d

Figure 2-12b Tunnel Stub Box – Cross Sections



Source: TJPA 2006, 2010a

Figure 2-13 Typical Tunnel Section with Rock Dowels

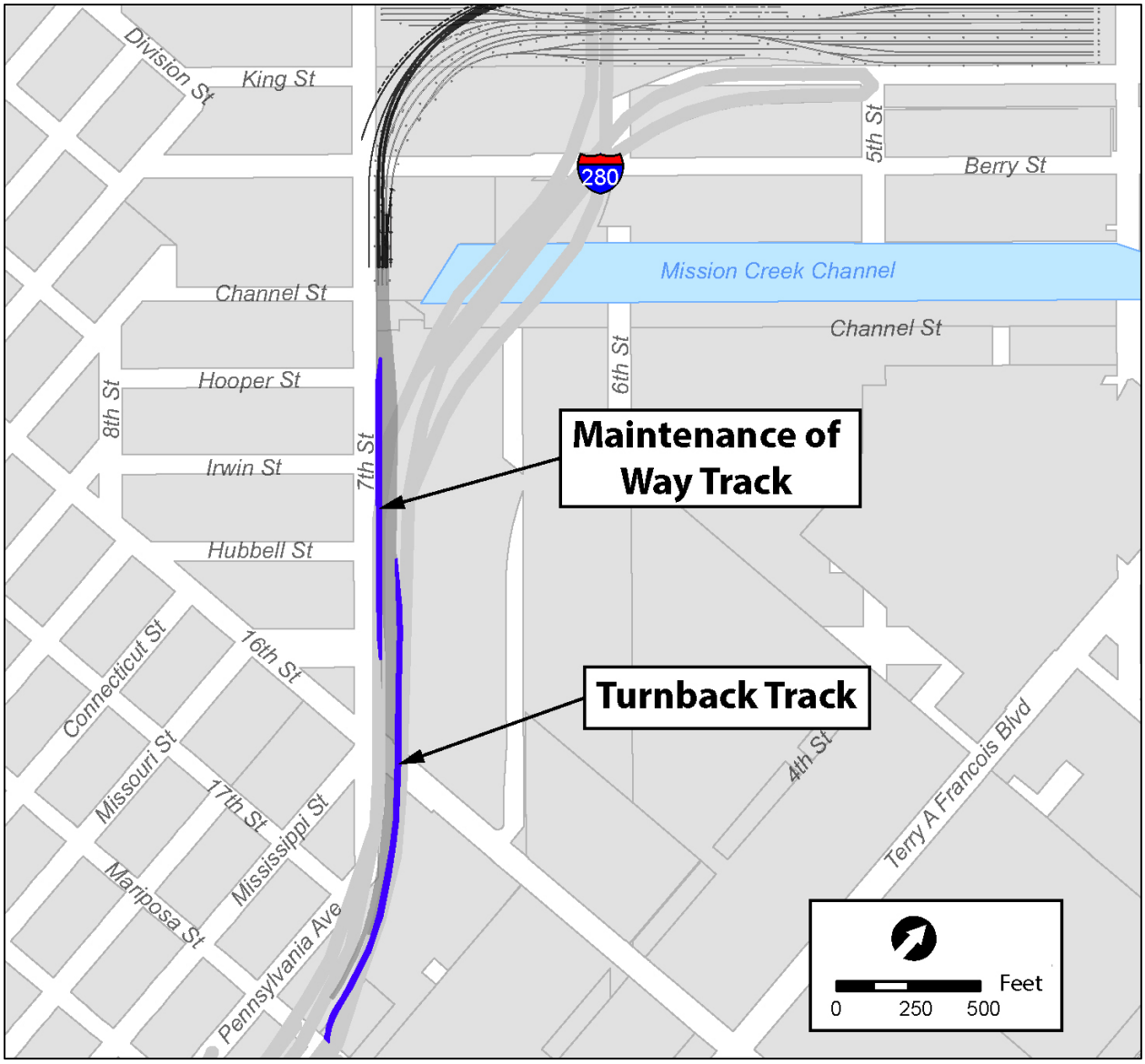


Figure 2-14 Additional Trackwork South of the Railyard

along the turnback track, crossing 16th Street at-grade, until Mariposa Street. Trains then would proceed north, back along the turnback track and would transition onto the mainline heading towards the Transit Center. The same movements would be followed in reverse to move trains from the Transit Center to the Caltrain railyard.

The second track improvement is an MOW storage track. This track would be constructed on the west side of the main tracks from Hooper Street on the north and would extend southward to Daggett Street for approximately 850 feet. The MOW storage track would be used for equipment storage, needed for railway maintenance.

Construction of the turnback track and MOW storage track is expected to occur after the PCEP, which is scheduled for implementation in 2020/2021, and would require: (1) relocation of the PCEP overhead catenary system (OCS) along the main tracks and modifications to specialty trackwork elements, such as control points, switches, and signals, and (2) avoiding interference between the 600-volt direct current

OCS for the electric trolley buses (ETB) at 16th Street and the 25 kVA alternating current OCS for the proposed project and the PCEP. TJPA has committed to pay for these modifications.

Operating plans for Caltrain service to the Transit Center still are being defined, and will vary based on service levels and overnight train storage assumptions at the Transit Center. Consistent with the Caltrain peak hour service levels analyzed in the cumulative conditions in the PCEP EIR (Peninsula Corridor Joint Powers Board 2015), the turnback track could be used between 10 to 40 crossings per day over 16th Street. Because the trains would be moved to the Transit Center for the first runs from the Transit Center and to the railyard for storage and/or maintenance after a run, few of the at-grade crossings along the turnback track are expected during the AM and PM peak periods (7 a.m. to 9 a.m. and 4 p.m. to 6 p.m.). The total time to move trains between the Caltrain railyard and the below-grade station at Fourth and Townsend is estimated to be approximately 10 minutes. Trains would cross 16th Street at-grade as they do currently for routine revenue service. During each crossing, the crossing gate at 16th Street would be lowered for 70 seconds (60 seconds for the train to cross and 10 seconds to raise and lower the crossing gate) to move the train to the end of the turnback track, and another 70 seconds to move the train north, back toward the mainline).

As part of this proposed project component, related modifications to the roadway configuration and signals along 16th Street in the vicinity of Seventh Street and the Caltrain right-of-way, may be necessary based on coordination and approval from the City and the California Public Utilities Commission (CPUC) pursuant to General Order 164. The San Francisco Municipal Transportation Agency (SFMTA) is proposing to re-route the 22 Fillmore electric trolley buses (ETB) from their current route, which crosses over the Caltrain right-of-way at 18th Street, to an at-grade crossing at 16th Street. TJPA, in cooperation with the Caltrain Peninsula Corridor Joint Powers Board and SFMTA and subject to CPUC approval, would modify, as necessary, the technical solution implemented by Caltrain for the PCEP to allow operation of both the ETB at the 16th Street crossing and Caltrain along the turnback track.

Other transportation system improvements included as part of the proposed project involve modifications to pedestrian, bicycle, and bus facilities, described below.

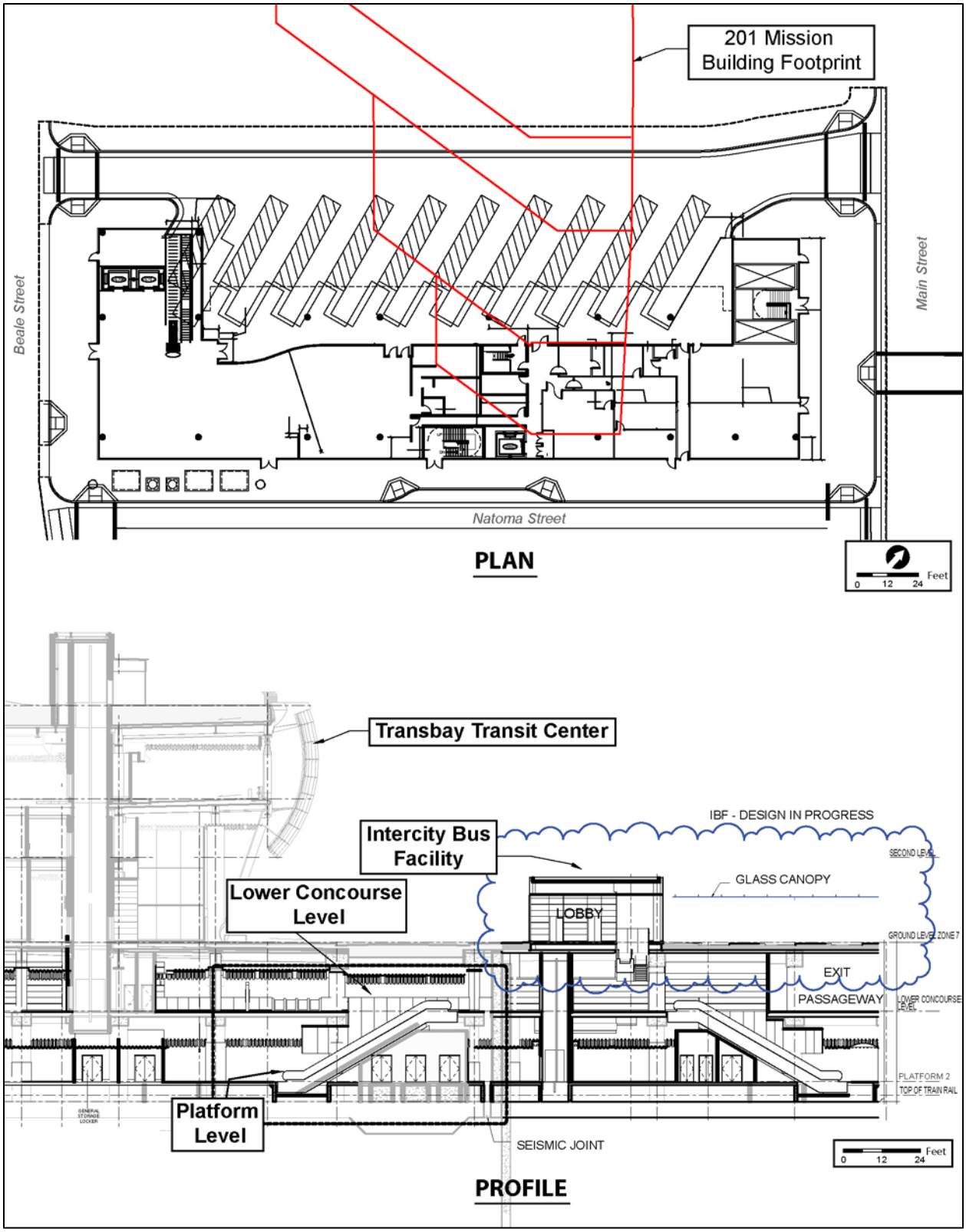
Other Transportation System Improvements

Intercity Bus Facility

As part of the proposed project, after the extended underground train box for the Transit Center is complete, an intercity bus facility would be constructed above the train box to accommodate regional and long-haul bus operators, such as Greyhound and Amtrak (see Figure 2-15). Amtrak is expected to shift its Ferry Building stop to the intercity bus facility. Located behind the 201 Mission Street building (south side), the intercity bus facility would be two levels above-grade (nearly 40 feet), with the ground floor serving passengers loading and unloading from the buses and administrative offices, and an above-ground level accommodating mechanical equipment and additional administrative offices for intercity bus facility service providers.

The intercity bus facility would accommodate shuttle services and bus operations, and would expand and enhance the Transit Center's inter- and intra-regional transit linkages by connecting into the two below-ground levels of the Transit Center (see Figure 2-15).

The level of activity, in terms of the number of shuttles and taxis, would be a function of the train and bus operations. The proposed intercity bus facility would provide ten berths for buses.



Source: TJPA 2011b

Figure 2-15 Intercity Bus Facility Levels 1 and 2 – Plan and Profile

Taxi Staging Area

Taxi pick-up/staging would occur at Ground level at the following locations (see Figure 2-16):

- Along the south side of Minna Street between First and Second Streets, providing taxi service to passengers as they exit from elevators and escalators near the Shaw Alley entrance, the elevators located near First Street, and from the Grand Hall.

- Along the north side of New Natoma Street between Beale and Main Streets and along the west side of Main Street between Natoma and Howard Streets, with a pick-up area on the south side of the intercity bus facility. This location would provide taxi services to passengers at the intercity bus facility and persons exiting the Transit Center at Beale Street.

Bicycle/Controlled Vehicle Ramp and Below-Grade Bicycle Facilities

The proposed project calls for installation of a bicycle ramp and below-grade bicycle facilities. The proposed bike ramp would reduce conflicts between bicycles, pedestrians, and vehicles. A separate controlled vehicle ramp would also run parallel to the bike ramp to access the Lower Concourse level. The vehicle ramp would be limited to a maximum speed of 15 miles per hour and would include speed control measures. The proposed plan would include a 500-bicycle storage facility, with room to potentially double this number to 1,000 bicycles. Bicycle storage is intended for all users of the Transit Center, and would have sufficient capacity to accommodate demand from future HSR passengers (Figure 2-17).

AC Transit Bus Storage Facility Parking

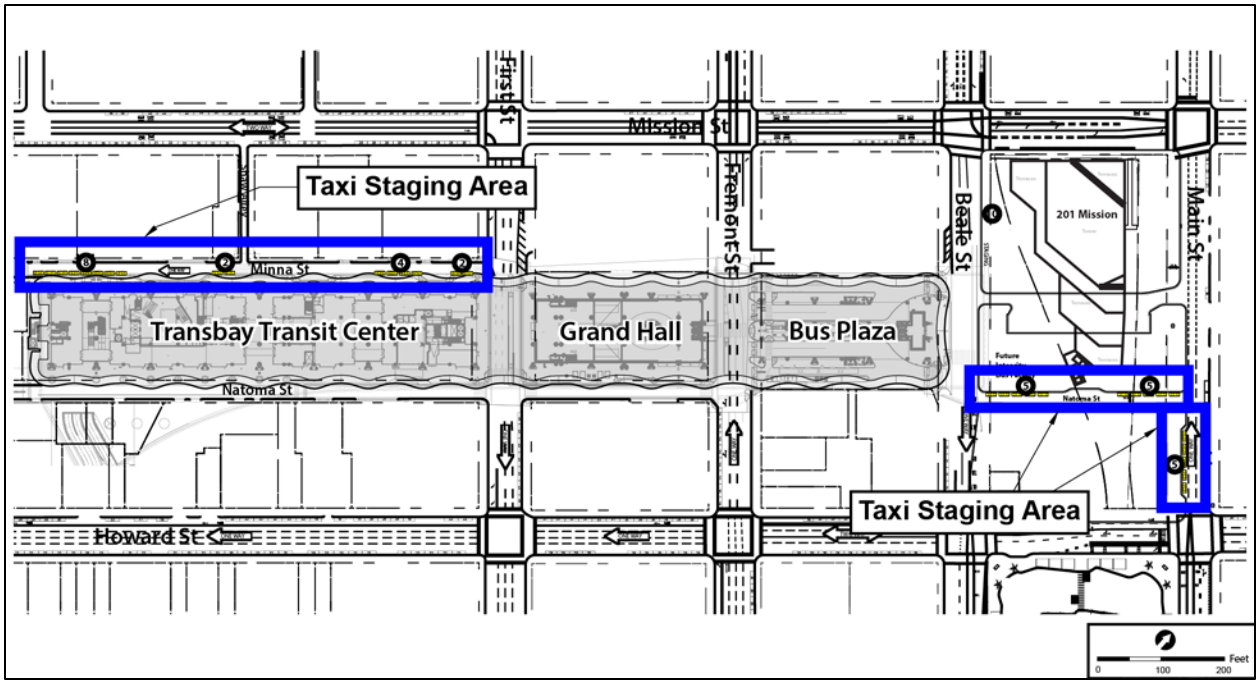
The AC Transit bus storage facility is bounded by Perry, Stillman, Second, and Third Streets, with bus access from Perry Street (Figure 2-18). Currently, this facility can accommodate up to approximately 73 buses. Under the proposed project, the AC Transit bus storage is proposed to be publicly used for off-hours/nighttime or event parking (e.g., nighttime sporting or special events) when not in use by AC Transit for regular operations. The AC Transit bus storage facility would have two potential modes of parking: 202 valet-parked spaces or 167 self-parked spaces. Because the valet option would result in more traffic, this option is evaluated in this SEIS/EIR (see Figure 2-18). Construction and use of this site for an AC Transit bus storage facility has already received environmental clearance and approval. No additional construction activities would be necessary to use this facility for public parking during off-hours.

Circulation and ingress/egress to and from the facility is addressed in Section 3.2, Transportation, of this SEIS/EIR.

BART/Muni Underground Pedestrian Connector

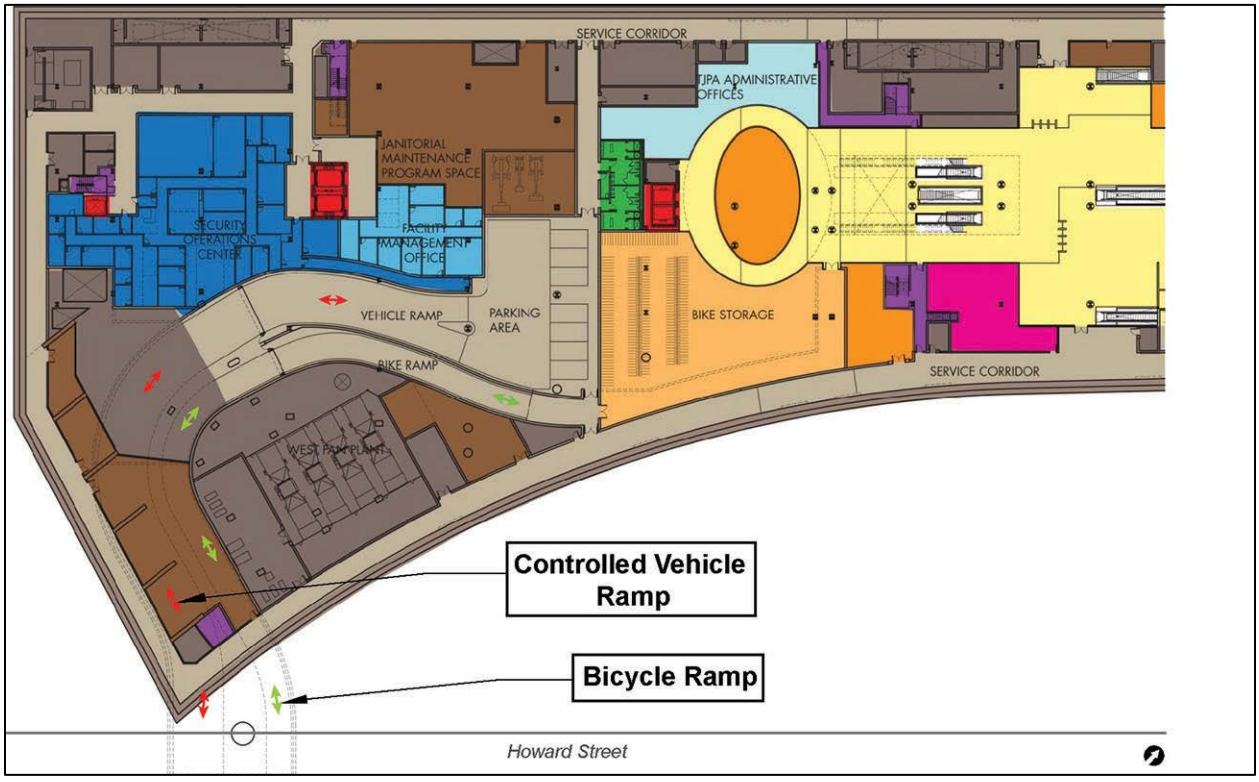
As described in Section 2.2.1, the 2004 FEIS/EIR evaluated a design option for a pedestrian connection from the Lower Concourse level of the Transit Center and underneath Fremont Street to the Embarcadero BART/Muni Metro Station. Subsequently, the TJPA undertook a study to evaluate alternative alignments for an underground pedestrian connection between the Transit Center and either the Embarcadero BART/Muni Metro Station or the Montgomery BART/Muni Metro Station.

The proposed project would include an underground pedestrian tunnel following Beale Street to provide direct connection between the Embarcadero BART/Muni Metro Station and the Transit Center, as shown in Figure 2-6. Figures 2-19a and 2-19b show the plan and cross-section views of this proposed project component. This is a more direct connection and is possible because the train box is proposed to extend to Beale Street.



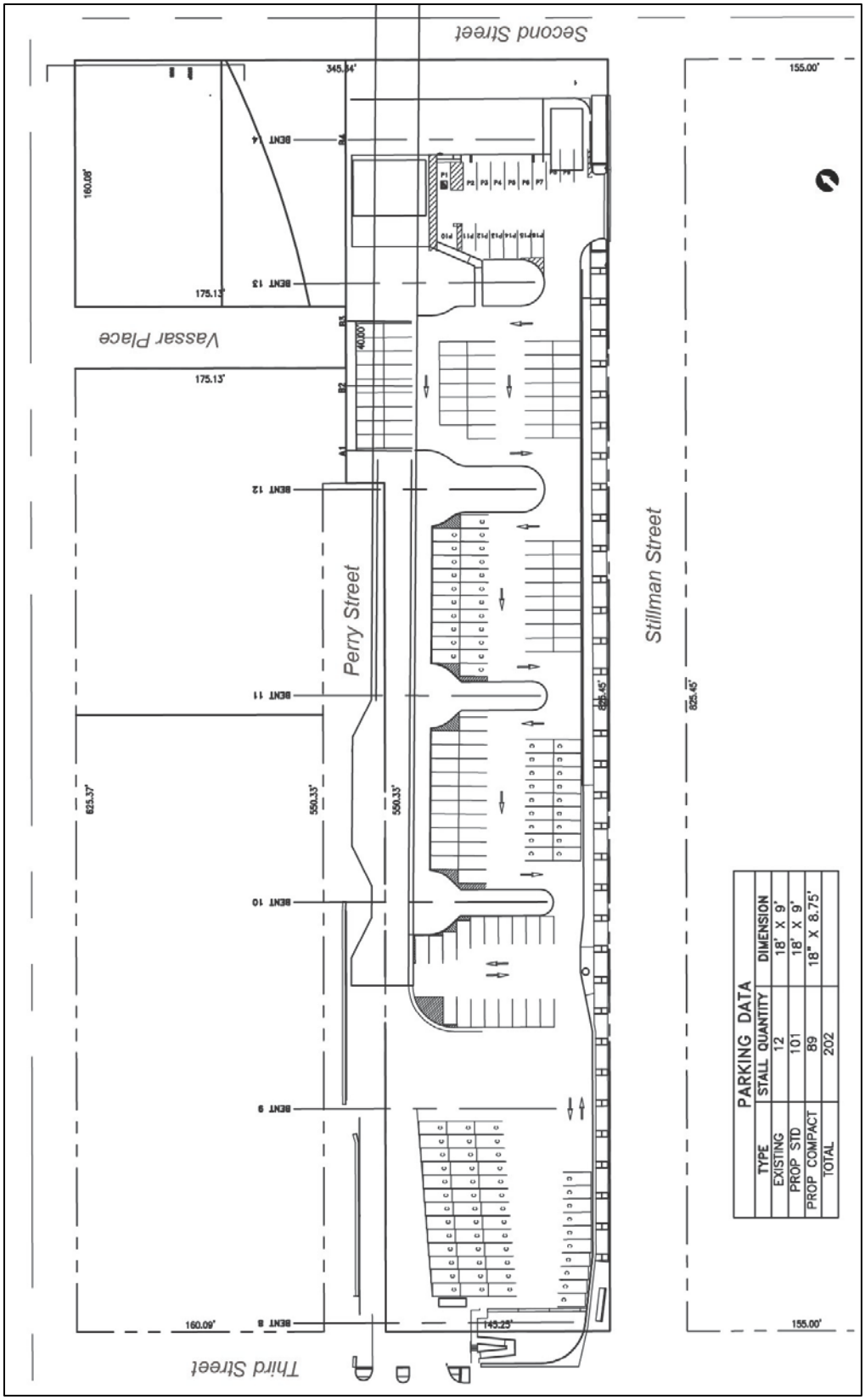
Source: TJPA 2014

Figure 2-16 Taxi Staging Areas



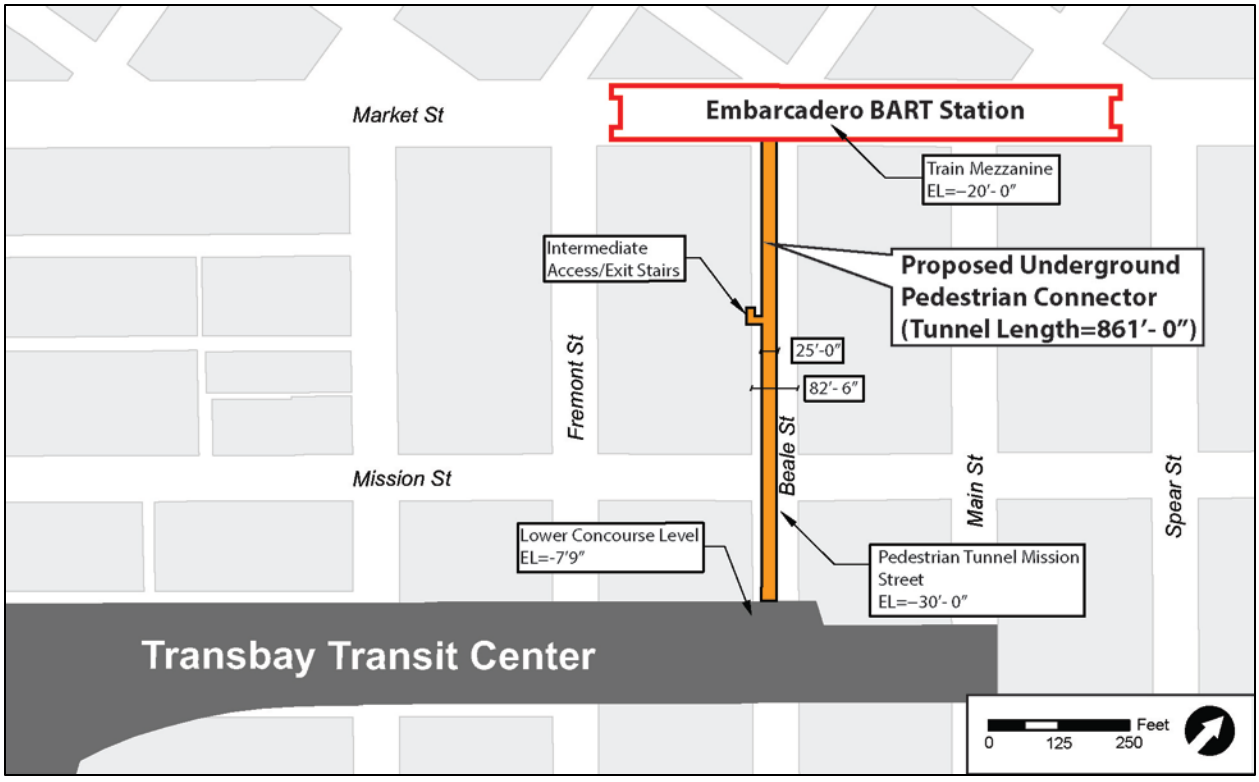
Source: TJPA 2013a

Figure 2-17 Bicycle and Controlled Vehicle Ramp and Below-Grade Bicycle Facilities



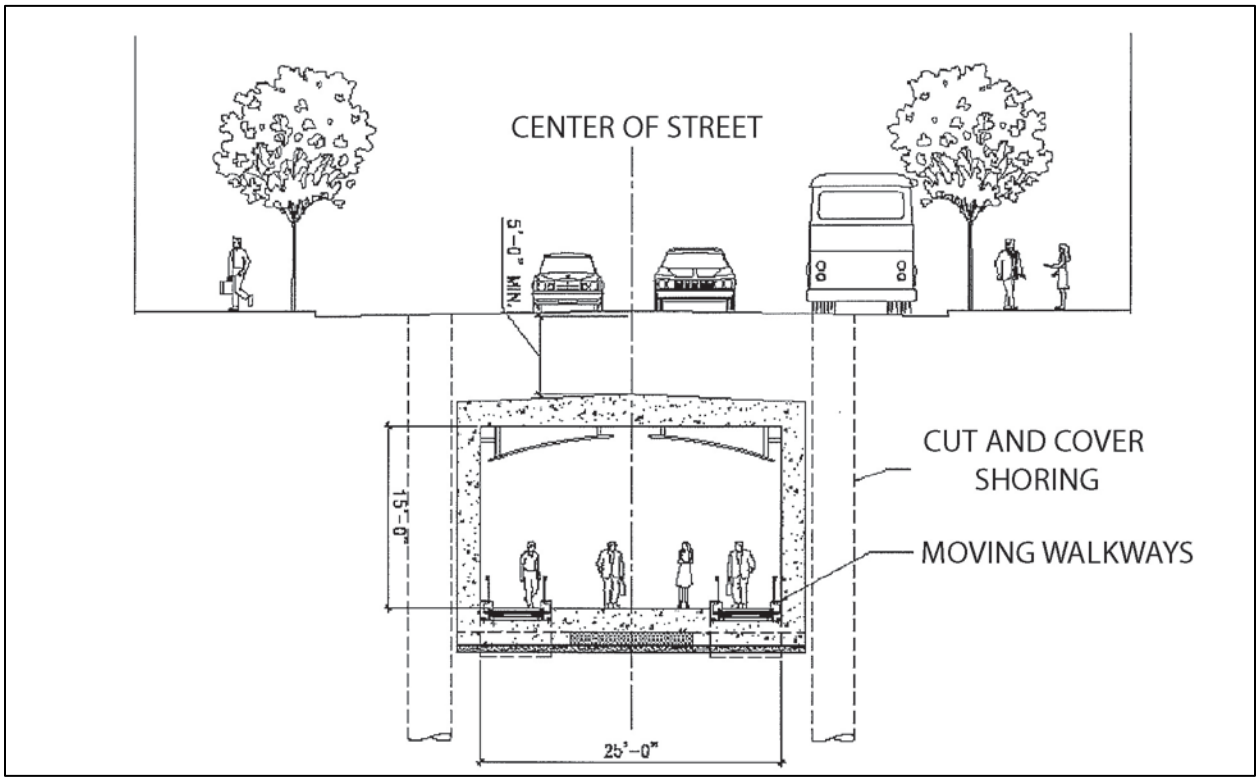
Source: TJPA 2012b

Figure 2-18 AC Transit Bus Storage Facility – Nighttime and Event Valet Parking



Source: AECOM, compiled from information from TJPA 2010b

Figure 2-19a Beale Street Underground Pedestrian Connector – Plan View



Source: TJPA 2010b

Figure 2-19b Beale Street Underground Pedestrian Connector – Cross Section

Based on preliminary engineering studies, it is anticipated that the envelope of the underground pedestrian connector would be approximately 860 feet long, 25 to 30 feet wide, and 20 feet high. It would connect to the Lower Concourse level of the Transit Center. The pedestrian connector would pass underneath Beale Street and connect with the Embarcadero BART/Muni Metro Station at Market Street. The depth of the connector would vary along Beale Street from 8 to 30 feet. The connector would be at its greatest depth of 30 feet below Mission Street to avoid major utility lines. According to estimates prepared by the TJPA in 2012, projected daily use could be 13,350 transferring passengers and 33,500 neighborhood passengers. The TJPA would not construct the underground pedestrian connector until station improvements are made at the EmbarcaderoBART/Muni Metro Station and can accommodate the incoming passengers. Construction of the Beale Street pedestrian connector would be largely dependent on BART, which must complete its Embarcadero Station capacity improvements study. In addition, the connector would require a memorandum of understanding between BART and the TJPA regarding security, maintenance, and project implementation/construction phasing responsibilities.

Adjacent Land Development under CEQA

Additional acquisitions and easements would be required to accommodate proposed project components that were not sited as part of the approved Transbay Program. To the extent that TJPA would not require use of the entire site for the proposed transportation facilities, these sites would offer additional development potential at the vent structure sites and intercity bus facility. Because these sites would be acquired by TJPA and would be part of the CEQA lead agency's action, the potential future development of the vent structure sites and intercity bus facility for uses other than transportation is part of the proposed project subject to CEQA review. However, this adjacent land development would not be under FTA's jurisdiction, and therefore is not considered as part of the proposed NEPA action, but is evaluated as a secondary or indirect effect under NEPA. The assumptions regarding the future potential development are highly conceptual and only suggest possible land uses and development intensities consistent with applicable City plans and zoning. As more detailed plans evolve for future development, they may require additional environmental review pursuant to CEQA. Refer to Section 3.1.4, Differences between CEQA and NEPA, for a further explanation of the difference in the treatment of adjacent land development.

Future Development Associated With Vent Structure Sites

Development opportunities exist at two of the vent structure sites where the footprint for the proposed ventilation shaft and emergency exit would not require use of the entire parcel:

- Third and Townsend Streets – At the preferred 701 Third Street site, 76,000 square feet of new development would potentially be feasible following construction of the vent structure. City zoning regulations allow a mix of uses at this site, including retail, office, and housing. Although no specific development program has been established, it has been assumed that a 4,000-square-foot restaurant and either 72,000 square feet of office space or residential development (72 units) up to 105 feet tall could be built adjacent to the vent structure. At the alternate site at 699 Third Street and 180 Townsend Street, approximately 72,000 square feet of new development could be constructed. City zoning regulations are designed to facilitate the expansion of existing general commercial, manufacturing, home and business service, live/work use, arts uses, light industrial activities, and small design professional office firms in structures up to 65 feet tall.

- Second and Harrison Streets – Development potential at this site was previously cleared as part of the Redevelopment Plan portion of the Transbay Program. Under the full buildout scenario described in the 2004 FEIS/EIR, this site could accommodate 121,500 square feet of new residential development (approximately 101 dwelling units) and 8,680 square feet of retail uses. The addition of the ventilation shaft/emergency exit at this site is not anticipated to alter the

number of units or the retail floor area. Future site planning and design for the land development portion of this site, and decisions regarding the appropriate housing type, could enable the approved 101 dwelling units to be constructed. As a result, for purposes of this SEIS/EIR, no change is proposed to the development program approved in 2004, and the evaluation of this site is focused on the effects of adding a ventilation structure.

Future Development Associated with the Intercity Bus Facility

The TCDP promotes additional development around the Transit Center to encourage transit-supported land uses and to reinforce the more intensive mixed uses that have changed the landscape of this area south of Market Street. The proposed project creates development potential above the proposed intercity bus facility located between Beale and Main Streets and along the new eastward extension of Natoma Street. Zoning for this site is C-3-O (SD), which allows buildings up to 400 feet in height. However, structures above the extended train box and intercity bus facility could not be developed to this height, in part because of restrictions on the structural load that can be placed above the train box. In addition, new development in this location would need to be designed to avoid casting shadows on City Park, the Transit Center's rooftop garden and park. To meet these considerations and the structural constraints of the site, it is assumed that a 75-foot-tall building would be the maximum height that would be developed on the proposed site, which would allow two additional levels developed above the intercity bus facility (for a maximum of four stories above street level). Two floors above the intercity bus facility would yield approximately 45,000 gross square feet. Two options are considered for this proposed project component: all office space (assuming 45,000 square feet) or all residential development (assuming a single-room occupancy development with a maximum of 350 square feet per unit, resulting in 128 housing units).

Construction Scenario and Activities

Overall Sequence and Timing

The timing and schedule for DTX is presented in Figure 2-20. This high-level overview identifies the major phases of work leading to the commencement of train service to the Transit Center. The next major phase will take approximately 3 years and involves completing the final design for DTX, which would advance the current "Preliminary Engineering" designs. Construction would take approximately 7 years and include initial work at the Caltrain railyard, demolition, and utility relocation; construction of the tunnel and ventilation buildings; installation of trackwork and systems required to operate the facilities; and final modifications at the Caltrain railyard. Testing and commissioning the system would occur following construction of the DTX facilities and can be completed prior to the final changes at the railyard (as illustrated in Figure 2-20).

Construction of the proposed project components would occur within the timeframe described above, since the proposed project consists largely of refinements to DTX. The anticipated sequence for the proposed project components is described below and shown in Table 2-4. The time frame and the phases would be highly variable and would be defined at the discretion of the contractor. The information below and shown in Table 2-4 is, therefore, only a conceptual overview of the construction schedule and methods, based on similar transportation projects.

- **During DTX Construction –** Proposed project components that are needed for the DTX or serve DTX operations, such as the widened throat structure, vent shafts, taxi staging area, and bicycle and controlled vehicle ramp to the Lower Concourse, would be constructed as part of Phase 2 of the Transbay Program. The vent structures were already anticipated as part of the construction analysis in the 2004 FEIS/EIR. The ancillary facilities at the Transit Center and at the Fourth and Townsend Street Station would be constructed as part of the stations, and the above-ground portions of the vent structures would be incorporated as part of the DTX facilities. The vent

structures that are not part of the stations (i.e., those at Third and Townsend Streets and at Second and Harrison Streets) were anticipated in different locations. Therefore, it is necessary to consider potential site-specific effects, both construction and operational, for these facilities as part of this SEIS/EIR. The timing of construction of these two non-station ventilation shafts would most likely be around the time of commencement of the DTX construction project, because the tunneling contractor would likely use these shafts to move and remove personnel, equipment, and material.

The train box is already under construction as part of Phase 1. However, its extension to comply with CHSRA standards would occur as part of Phase 2.

- **Post-DTX Construction –** The intercity bus facility could be constructed once the extended train box is completed.

- **Independent of DTX Construction –** Nighttime and/or event parking at the AC Transit bus storage facility could begin at any time and is not dependent on DTX construction. As stated earlier, construction of the AC Transit bus storage facility has already been environmentally cleared. The addition of nighttime/event parking for the public would not involve new construction activities.

- **Uncertain Timing, Pending Negotiations with Others –** Some proposed project components, such as the underground pedestrian connector to the Embarcadero BART/Muni Metro Station and adjacent land development at the sites of the intercity bus facility and the vent structures, would require participation of other entities in addition to the TJPA, including coordination with BART and other agencies, property owners and developers, and agreements between the TJPA and other entities. Therefore, the timing for construction of these proposed project components is uncertain.

Construction Staging

Construction staging areas would be needed for the proposed project. Primary staging areas would be located in the three areas listed below and shown in Figure 2-2:

1. Vent structure site at 701 Third Street or the alternate site at the northeast corner of Third and Townsend Streets
2. Vent structure site at Second and Harrison Streets
3. Throat structure area

Activities that would occur at these sites primarily include stockpiling of materials and storage of equipment. It is expected that the contractor would rent local office space to use as a construction office. Some equipment needed for cut-and-cover activities is heavy-duty machinery that requires adequate space when standing still and additional space for turning and maneuvering.

Construction Activities

Each of the proposed project components would involve different structures and facilities, and, thus, the duration of construction, the quantities of construction materials, and the types of construction equipment would vary. However, the basic steps would generally be similar and are described below. Equipment associated with each construction type is shown in Table 2-5. The construction crew would average approximately 25 workers per day for each project component site. The total number of construction workers would fluctuate greatly depending on the number of active concurrent project components. The TJPA does not provide parking for construction workers. Public transportation and public parking

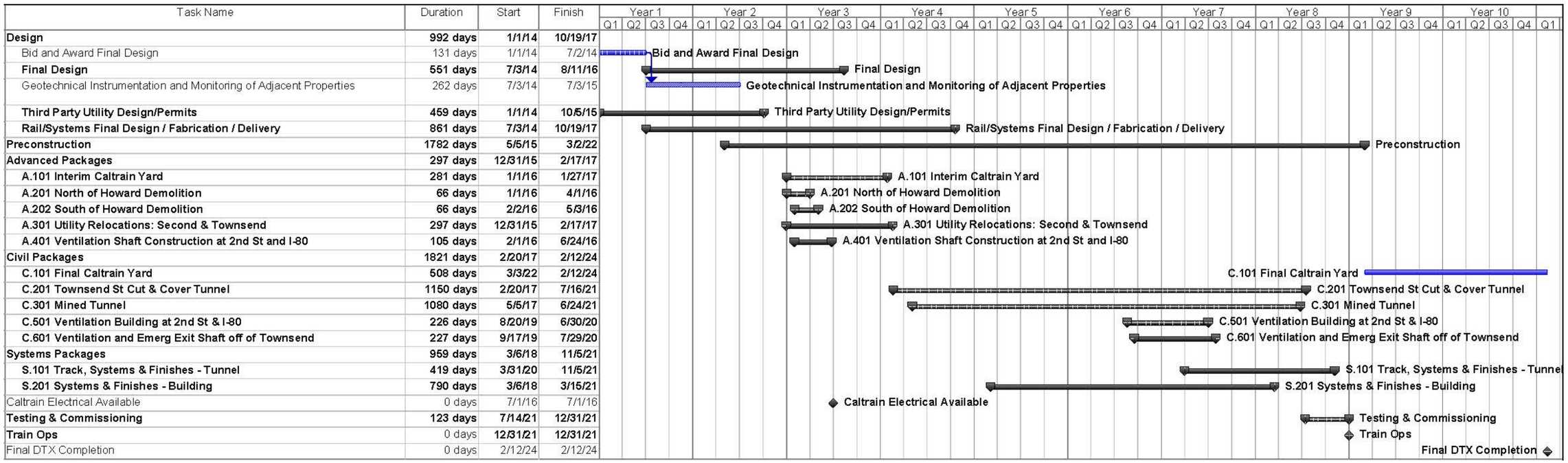


Figure 2-20 Transbay Program DTX Schedule

Table 2-4
Proposed Project Components Construction Schedule

Project Component	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8				Year 9				Year 10			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Utility Relocations	x	x	x	x	x	x																																		
Caltrain Yard																																								
Interim	x	x	x	x	x																																			
Tunnel Stub Box																																								
Final Configuration																										x	x	x	x	x	x	x	x							
Vent/Egress Structures[1]																																								
2nd/Harrison Shaft																																								
2nd/Harrison Vent/Egress Building															x	x	x	x	x																					
3rd/Townsend Shaft																																								
3rd/Townsend Vent/Egress Building																x	x	x	x	x																				
Tunnel																																								
Townsend Cut-and-Cover						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																	
Mined Tunnel							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																		
Widened Throat Structure																																								
Demolition to clear right-of-way	x	x																																						
Excavation and Construction																																								
Extended Train Box																																								
Extended Train Box																																								
Intercity Bus Facility[2]																																								
P2 Transit Center Systems and Finishes										x	x	x	x	x	x	x	x	x	x	x	x	x																		
Tunnel Track, Systems, Finishes																			x	x	x	x	x	x	x															
Testing and Commissioning																									x	x															
Underground Pedestrian Connector[3]	Can occur at any time per BART/TJPA agreement.																																							
AC Transit Bus Storage Facility Parking[4]	Can occur at any time after completion of Bus Storage Facility.																																							

Legend
FEIS/EIR (2004)
x DTX components
SEIS/EIR refinements
Shoring
Excavation
Construction

Notes:
1 To provide access, vent shafts would be constructed in advance of the mined tunnel segment. Adjacent development would occur after completion of the vent structures and its timing would depend on market conditions and developer readiness. It is speculative to assume when this would occur and, therefore, not identified here.
2 The intercity bus facility construction could start upon completion of the extended train box. Development above the intercity bus facility would depend on market conditions and developer readiness. It is speculative to assume when this would occur and, therefore, not identified here.
3 The underground pedestrian connector to the Embarcadero BART/Muni Metro Station is contingent on negotiations between BART and the TJPA. To portray a conservative construction scenario when as many activities occur concurrently as feasible, it has been assumed that construction for this component would coincide with other components.
4 Construction of the AC Transit bus storage facility was environmentally cleared in the 2004 FEIS.EIR and is planned when the Temporary Transit Terminal closes. Nighttime/event parking studied under this SEIS.EIR would require minimal construction, all of which would occur on-site, such as asphalt striping and ticket concession installation. Accordingly, any construction impacts would be negligible.

Table 2-5
Construction Equipment

Demolition and Utility Relocation
• One excavator • Five trucks for debris
Shoring
• Two cranes on tracks with 100-foot boom • One excavator with 1-cubic-yard bucket • One pile rig and one auger rig • Delivery trucks
Excavation and Bracing
• Up to two 385 track excavators • Up to 10 dump trucks • One crane on tracks with 100-foot boom
Concrete Structural Work
• Rebar trucks • Concrete trucks
Backfill Excavation
• Import trucks • One D9 dozer • One vibrating sheep's foot roller
Source: Compiled by TJPA and AECOM in 2013

facilities are available within the area. Approximately 50 percent of the current Transit Center work force uses carpools and public transportation to go to and from work.

Demolition and Utility Relocation. The demolition requirements differ for each proposed project component, as some locations are currently parking lots or open space along train tracks and others have small- to medium-sized buildings that must be demolished prior to beginning the shoring and excavation phases of construction. For Transit Center construction, the demolition contractor was able to recycle more than 99 percent of the former Transbay Terminal building; this rate of recycling is considered applicable to demolition for the proposed project components. As part of this step, the contractor would remove buildings and building foundations and surrounding hardscape (i.e., asphalt and concrete) and relocate utilities outside of the structure footprint. Construction equipment for this step would generally include excavators and trucks.

Shoring. For most of the proposed project components, a cement deep-soil-mixed (CDSM) shoring wall would be installed to prevent soils and rock from sloughing or collapsing into excavated areas. The underground pedestrian connector under Beale Street would need shallow shoring since the excavation depth is up to 30 feet. Construction equipment for this step would generally include cranes, excavators, and trucks.

Excavation and Bracing. This step would involve the removal of soil from the construction site. When excavations have the potential to affect occupants or the building structure of adjacent properties, bracing

must be installed to support the soil. Bracing installation is advanced sequentially as the excavation proceeds, often with horizontal walers and cross-lot struts that extend across the excavation. After completing excavation and final bracing, the concrete work would proceed. The bracing would subsequently be removed as the concrete structure advances up to the ground surface. Construction equipment for this step would generally include excavators, trucks, and cranes.

Concrete Structural Work. The structural concrete work would typically require a thickened mat slab (3 to 5 feet thick). The wall sections would generally be 3 feet thick. Construction equipment for this step would generally include trucks, a dozer, and a vibrating sheep's foot roller.

Backfill Excavation. Excavated areas would be backfilled with earth fill, and road reconstruction or paving would occur on top of this backfill. Construction equipment for this step would generally include trucks and a vibrating sheep's foot roller. Backfill would be primarily for the widened throat structure and the tunnel stub box. Little to none of the materials excavated for proposed project components would be acceptable for engineered backfill. It is not expected that stockpiling of excavated materials would occur at the various construction sites; rather, excavated materials would be removed by truck similar to the current practice for Phase 1 construction.

Widened Throat Structure

Construction for this proposed project component would be performed using cut-and-cover techniques. Shoring walls would be constructed on either side of the throat structure and the area would be excavated to the bottom of the structure. Once the throat structure box is completed, the site would be backfilled to the original grade.

The widened throat structure would be constructed underneath portions of two developed parcels and would impact the foundations of the overlying properties. CBS occupies a six-story structure with a one-story basement at 235 Second Street, and a mix of businesses occupies a five-story building at 589 Howard Street. Because a portion of the CBS building would be directly above the throat structure, the portion of the building above the structure would be demolished. A temporary support wall would be constructed along the portion of the building that would remain. Following construction and backfilling, the portion of the building that was demolished would be restored.

For 589 Howard Street, the basement space located beneath the sidewalk on the north side of the building would be demolished. Shoring walls would be constructed on either side of the throat structure box to retain the soil beyond the limits of the box, and the site would be excavated to the bottom of the box. Because a portion of the building at 589 Howard Street overlies the box, large-diameter piles would be installed and then an underpinning beam would be placed to support the building while the widened throat structure is constructed.

Under the proposed project, the widened throat structure would be shifted to the east from the previously approved alignment. Because the southwest wall of the DTX would pass beneath the tip of the southeast corner of 165-173 Second Street (current address 171 Second Street), acquisition and demolition of this building (identified in the 2004 FEIS/EIR) would no longer be required. The southeast corner of 171 Second Street would be underpinned if necessary to support the building on the property during construction, using the same construction methods for underpinning the building at 589 Howard Street described above.

Extended Train Box

The east end of the train box, which is now under construction, is proposed to be extended to Main Street. The demolition step would remove portions of the building on the south side of 201 Mission Street,

involving the first- to fourth-floor exterior stairs, planters, and open patio sitting areas. The core building footprint of 201 Mission Street would remain, but some office space, utility functions, and surface parking areas would be displaced. Building modifications to relocate electrical service, to re-route emergency egress, and to ensure continued structural integrity of the tower portion would be required. Construction phasing would maintain building operations. After demolition and removal of subgrade obstructions, the contractor would install the CDSM shoring wall for the train box extension, beginning along the existing CDSM shoring wall on the east side of Beale Street. After the shoring wall is constructed, excavation and bracing would begin. When excavation has occurred to the correct depth, the structural concrete box would be constructed.

Vent Structures

Realigned Fourth and Townsend Street Station. The vent structure sites are along the northern portion of the Caltrain railyard. The west vent structure area (at Fifth Street on the south side of Townsend Street) currently is used as a Caltrain employee parking lot. The east vent structure area (at Fourth Street on the south side of Townsend Street) currently is occupied by the Caltrain Fourth and King Street station building as the northeast access point and for bicycle parking. Caltrain and TJPA have coordinated on the development of the station plans, and TJPA has committed to reduce construction-related effects of the proposed project on the existing station and its access and operations. In the Preliminary Engineering Construction Estimate for the Caltrain Downtown Extension Project (TJPA 2010c), TJPA has committed up to $25 million to mitigate construction-related impacts of the Fourth and Townsend Station on the existing Caltrain support facilities, including administration and storage buildings, bike storage, employee parking, and crew facilities.[4]

Second and Harrison Vent Structure. This vent structure site is a triangle-shaped property that is currently used as a parking lot. It is located near Interstate 80 on-ramps and is surrounded by office, retail, and other surface parking uses. Only minor demolition and utility relocation would be required to construct a ventilation shaft on this site. Often, once a shaft is excavated into the ground such as the proposed ventilation shaft, that shaft is used as a portal for moving personnel, equipment, and material during tunnel excavation. Once the tunnel is completed, the vent structure would be completed above ground.

701 Third Street Vent Structure. The proposed vent structure site at 701 Third Street is currently a fast food restaurant and is surrounded by office, residential, and retail uses. The alternative vent structure site at the northeast corner of Third and Townsend Streets is occupied and is surrounded by retail and office uses.

Construction at either the 701 Third Street site or the site across the street at 699 Third Street would require demolition of the existing buildings and utility relocation, after which the contractor would remove underground obstructions in the pathway of the CDSM shoring wall. Like the Second and Harrison Street vent structure, the Third and Townsend Street facility could be used as a portal for moving personnel, equipment, and material into the tunnel. This structure is close to the proposed Sixth and Townsend Street portal, and, thus, may not be used as much as the Second and Harrison Street vent structure to assist in DTX tunneling. If this vent structure is not used for logistical support for the tunnel mining, then vent structure construction could be finished early.

[4] See Preliminary Engineering Construction Cost Estimate (TJPA 2010c), Vol. 1, page 21, cost item #30 (Support Facilities: Yards, Shops, Adm. Bldgs.), which is intended to address DTX costs that include Caltrain's existing support facilities, such as the administration buildings, and storage or MOW building.

Tunnel Stub Box

This DTX refinement would involve extensive underground shoring and construction of a cut-and-cover tunnel box. The shoring wall would be installed, allowing excavation to proceed. Once the final excavation depth is reached, the tunnel box would be constructed and backfilled. More than 300,000 cubic yards would be excavated, and approximately 200,000 cubic yards would be needed for backfill.

Underground Pedestrian Connector

The proposed Embarcadero BART/Muni Metro Station underground pedestrian connector tunnel is not expected to be built until after the DTX is finished. The connection would be constructed with cut-and-cover techniques. Because the alignment of the connector would be in the Beale Street right-of-way, no demolition of above-ground structures would be needed, and utilities would be protected in place. Shoring walls would be installed and then excavation would occur. The pedestrian box would be constructed and then the construction site would be backfilled.

Tunnel Construction Method

Stacked drift methods, as described and evaluated in the 2004 FEIS/EIR, are rarely employed in tunneling work at the present time because of high cost and the extended construction time. It is now proposed that the DTX tunnel segment be constructed using the Sequential Excavation Method (SEM), a modification of the New Austrian Tunneling Method (NATM). The NATM/SEM has been used in the U.S. since the early 1980s on a variety of transit projects, including projects in the Bay Area.

The basic principle of NATM/SEM design is to allow controlled ground movements to mobilize the strength of the ground. These movements significantly reduce the loads on the final lining. Rock bolts, lattice girders, shotcrete, and wire mesh are employed instead of heavy timber or steel supports to develop the strength of the ground without compromising excavation stability. Advantages include a very rigid support system that minimizes ground movements and minimizes the risk of a tunnel collapse.

Surface settlement could be greater with the NATM/SEM method, but not substantially different compared to the stack drift approach. Under either technique, close monitoring would be required so that risk of damage to overlying buildings along the tunnel alignment is controlled. In most cases, an NATM/SEM approach is less expensive and usually capable of providing acceptable results from a technical point-of-view. Based on further engineering studies after the completion of the 2004 FEIS/EIR, TJPA estimated that the stacked drift method would be approximately 30 percent more expensive than the SEM approach, and would have a construction duration approximately 2 years longer. Besides the cost and schedule advantages, some other advantages of the NATM/SEM approach compared to the stacked drift method include less need to perform blasting because the larger drift sizes would allow the use of larger roadheaders. In addition, lower truck-traffic volumes during tunnel excavation and more economical and efficient ground support measures could be tailored to the ground conditions actually encountered (Parsons 2008).

Summary of the Proposed Project

Table 2-6 shows the proposed project compared to the No Action Alternative components.

Table 2-6
Comparison of No Action Alternative and Proposed Project Components

Approved Phase 2 Transbay Program Components (No Action Alternative)	Proposed Project
• Two-track lead on the surface and below-ground leading to the DTX tunnel system just before the underground Fourth and Townsend Street Station • Cut-and-cover Fourth and Townsend Street Station at a relatively shallow below-ground profile, with an alignment slightly skewed from Townsend Street • Three tracks beginning at the underground Fourth and Townsend Street Station and continuing to the throat section approaching the Transit Center where the three-track system splays to six tracks to accommodate the six platform berthing locations within the station • At-grade rail car storage within the existing Caltrain rail storage yard • Design provisions to allow for a future connection to the cut-and-cover tunnel on Townsend Street that will facilitate construction of future system capacity for Caltrain and HSR, and capable of accommodating construction of the Townsend/Embarcadero/Main Loop • Reconfiguration of the existing Caltrain tracks and platforms at the Fourth and King Station to be sited primarily on the south side of the railyard	• Realignment of the Fourth and Townsend Street Station and further below street level • Addition of a below-grade tunnel stub box at the west end of the railyard beneath the approved U-wall • No reconfiguration of Caltrain tracks and platforms to the south side of the railyard • Additional trackwork south of the railyard (turnback track and MOW track) within the Caltrain right-of-way along Seventh Street
• Mined tunnel from Townsend Street curvature and along Second Street	• Installation of rock dowels along portions of mined tunnel from Townsend Street curvature and along Second Street • Proposed tunneling using the Sequential Excavation Method
• Underground Transit Center train box terminates at Beale Street	• Underground Transit Center train box extended east to Main Street • Demolition of above-and below-grade podium structure at 201 Mission Street resulting in loss of parking, office, and open space • Construction of an intercity bus facility and additional office or residential development (total of four levels) above the train box extension area
• 970-foot-long curve with track curve radii of 498 to 545 feet at the throat structure entering the west side of the Transit Center under Lower Concourse; related property acquisition	• 970-foot-long curve with track curve radius of 650 feet at the throat structure entering the west side of the lower levels of the Transit Center • Additional 14,059-square-foot increase in footprint • Use of two additional parcels (235 Second Street and 589 Howard Street) • Prior demolition of building at 165-173 Second Street (current address 171 Second Street) no longer required
• 800-foot-long pedestrian connection underneath Fremont Street to the Embarcadero BART/Muni Metro Station	• 800-foot-long pedestrian connector underneath Beale Street to the Embarcadero BART/Muni Metro Station
• Assumed ventilation shafts at each end of the new Transit Center • Ventilation shafts with emergency exits along Main Street, just north of Harrison Street • No ventilation shafts at the Townsend Station	• Revised and proposed additional locations for vent structures: - At the new Transit Center: one vent structure/cooling tower and two exhaust fans at the west end and one vent structure at the east end

Table 2-6
Comparison of No Action Alternative and Proposed Project Components

Approved Phase 2 Transbay Program Components (No Action Alternative)	Proposed Project
• Emergency exit shafts at Second and Brannan Streets, and Second and Howard Streets	- At the Fourth and Townsend Street Station: one at each end - One vent structure each at Third and Townsend Streets and at Second and Harrison Streets
• No taxi staging	• Addition of a taxi staging area at curbside along portions of Minna and New Natoma Streets
• Bus ramp	• No change to bus ramp • Addition of bicycle/controlled vehicle ramp from Howard Street leading to Lower Concourse level • Below-grade bicycle storage facility for up to 1,000 bicycles
• No public use of facilities for off-hours/nighttime or event parking	• Use of the AC Transit bus storage facility by the public for off-hours/nighttime or event parking (202 valet parked or 167 self-parked spaces)
• Operations – Multi-modal Transit Center (serving rail, bus, shuttle, taxi, bicycle, pedestrian), DTX	• No change
Source: Compiled by AECOM in 2015	

2.3 OPERATIONS

The 2004 FEIS/EIR examined the effects of 132 Caltrain trains per day in 2020, involving 29,300 daily Caltrain boardings and alightings, in addition to 43,000 daily HSR boardings and alightings (FTA 2004).

In 2008, the TJPA updated ridership numbers for the DTX forecasted to 2030. These ridership forecasts varied in response to different factors, including Caltrain's service plans that considered the number of regular versus baby bullet trains, the number of peak-hour trains that use the existing Caltrain terminus at Fourth and King Streets versus those that would use the new Transit Center, and the frequency of the trains; the price of gas; and future land use and population/employment forecasts. Taking these varying assumptions into consideration, daily Caltrain boardings and alightings were estimated to range between 29,700 and 31,500 (TJPA 2008). These ridership figures compiled by the TJPA for DTX are still considered to be both reasonable and conservative forecasts today, providing a good measure of the total daily Caltrain ridership.

In 2010, the FRA undertook a reevaluation of the 2004 FEIS/EIR, as amended, specifically to address HSR operations. HSR ridership forecasts for the year 2035 were used for the 2010 Reevaluation, which included a projected 48,200 HSR boardings and alightings at the Transit Center (FRA 2010). The 2010 reevaluation also provided an updated examination of the anticipated level of transit, taxi, parking, and non-motorized traffic (i.e., pedestrian and bicycle) use, all of which are projected to increase around the Transit Center, but at levels not substantially different than portrayed in the 2004 FEIS/EIR.

Both Caltrain and the CHSRA have since issued documents that provide updated service plans and ridership forecasts, including the Caltrain PCEP EIR and the CHSRA's 2012 and 2014 Business Plans. The Electrification Project EIR includes forecasts of Caltrain ridership in 2020 and 2040. The 2020 project-level ridership assumes all trains terminate at the existing Caltrain terminus in San Francisco at Fourth and King Streets, as the DTX would not be in place by 2020. The cumulative analysis in 2040

includes Caltrain ridership forecasts to the Transit Center. The boardings and alightings differ from those reported in the 2004 FEIS/EIR for DTX, in part because of different assumptions about the number of trains that use the Fourth and King Street Station versus the Transit Center.

The CHSRA 2014 Business Plan, released in April 2014, describes a phased implementation strategy for the HSR that makes early investment in existing passenger rail systems, including Caltrain, which would supplement and connect with HSR service. The Business Plan also emphasizes "blended" operations and systems that are aimed at improving existing systems to accommodate the electrified HSR and to coordinate shared, or "interlining," of Caltrain and HSR service. The blended system approach is the framework for the HSR system implementation in the CHSRA 2014 Business Plan. According to the CHSRA, the most recent ridership forecasts for the Transit Center in 2040 project approximately 35,460 daily "access" and "egress" trips (CHSRA 2015).[5] These forecasts do not include visitors to the State or passengers within the State who may have out-of-State destinations, both of which would increase the passengers entering and leaving the Transit Center.

These more recent plans and forecasts consistently reflect a shared use ("blended" operations) of the Caltrain corridor with up to 10 trains per peak hour per direction to and from San Francisco. The 10 tpph/d for the blended operations assumes a service level of 6 Caltrain tpph/d and 4 HSR tpph/d. Implementation of the blended system and the responsibilities of the train operators is documented in an MOU, as described earlier (CHSRA 2012). However, the specific number of Caltrain or HSR trains that terminate at the Transit Center varies with the service planning and forecasts of boardings and alightings of the two operators. More precise numbers of Caltrain or HSR trains that could proceed all the way to the Transit Center, and the associated ridership, would be determined in the future based on the final platform and track design at the Transit Center and the service plans of the operators. System operations and ridership forecasts would continue to be refined over time as new infrastructure and services are planned and implemented. Given these ongoing adjustments, this document relies on the 2008 TJPA ridership analysis, which provides a comprehensive measure of total daily rail passengers that would pass through the Transit Center.

2.4 ALTERNATIVES PREVIOUSLY CONSIDERED AND REJECTED FOR FURTHER REVIEW

As described at the outset of this chapter and summarized in Table 2-1, the Transbay Program has a long history and has undergone extensive planning and environmental studies. Documentation of these past efforts of the Transbay Program that examined multiple DTX alignment options and station locations is informative to understand the wide-ranging alternatives that were considered and withdrawn in favor of the Transbay Program that was adopted in 2004 by the City. This documentation is provided in Appendix B to this SEIS/EIR.

The proposed project components involve discrete refinements, modifications, or enhancements to the previously approved Phase 2 of the Transbay Program. Although no overall alternative exists to these proposed project components other than the No Action Alternative, the TJPA has considered options for several of the proposed project components. These options and the reasons for their withdrawal from further consideration are shown in Table 2-7.

[5] "Access" trips refer to those between the trip origin and the HSR station, and "egress" trips refer to those between the HSR station and the destination. CHSRA recognizes that some access/egress trips projected for the Transit Center may use the Millbrae Station instead and vice versa. The CHSRA, therefore, recommends for purposes of station area planning that the station volumes be considered together. The combined ridership forecast for the two stations in 2040 is 43,930 daily trips.

Table 2-7
Proposed Project Component Alternatives Considered but Withdrawn

Project Component	Alternative(s) Considered	Alternative Description	Reasons Why Rejected
Widened Throat Structure	Smaller horizontal curve radius	Construct smaller radii, involving tighter turns, to avoid property impacts.	• Reduced operational speed • Increased maintenance requirements and costs • Greater wheel squeal/noise impacts • Potential limitation on the length of the trains
	Modified construction methods at 589 Howard Street, an historic building	Remove the portion of the building over the widened throat structure and reconstruct the building once DTX construction is finished.	• Adverse effect under NEPA and significant unavoidable impact under CEQA to a historic building • Risk of inadvertent damage or loss of integrity during reconstruction phase • "Use" of a historic site where a prudent alternative exists that could avoid this Section 4(f) effect
Second and Harrison Streets Vent Structure	Alternative vent structure sites	Consider other sites in the vicinity of the Second and Harrison Streets intersection or along Second Street.	• Proximity to tunnel section is important for emergency exits; sites that are farther from alignment would require greater evacuation times and would be more costly because additional underground construction would be required to connect the tunnel to the exit • Sites that were fully developed would be more costly to acquire and involve displacement of building occupants
Third and Townsend Streets Vent Structure	Alternative vent structure sites	Consider other sites in the vicinity of the Third and Townsend Streets intersections, adjacent to the DTX cut-and-cover section along Townsend Street, and along the alignment.	• Safety requirements such as spacing of emergency exits to code standards • Proximity of ventilation zones (between tunnel-level vent openings) with signaling and other train systems to allow the movement of trains and evacuees in an incident area to be coordinated with the controlled evacuation of smoke • Constructability factors such as being able to use the space for emergency exit for both tunnel construction staging area and access for building other parts of the DTX tunnel
Taxi Staging Areas	Alternative loading spaces locations for taxi pick-up and staging	Consider other streets around the Transit Center and intercity bus facility (along Beale Street between Mission and Natoma Streets), and in the basement level of future development adjacent to the intercity bus facility.	• The use of Beale Street conflicted with City plans for bicycle lanes and other improvements • Uncertainty about the future development south of the intercity bus facility and the available space in the underground parking area resulted in consideration of surface street options

CHAPTER 3 AFFECTED ENVIRONMENT, CONSEQUENCES, AND MITIGATION MEASURES

3.1 INTRODUCTION

This chapter describes the existing setting of the project area; the federal, state, and local regulatory framework applicable to implementation of the No Action Alternative and the proposed project; and the impacts associated with the alternatives, including applicable mitigation to reduce potential impacts.

3.1.1 Scope of the Analysis

The following resources were considered but not addressed in the detailed impact analysis because the resources were not present in the project area: mineral resources, agricultural lands and forest resources, Section 6(f) resources, and Indian trust assets.

The effects of the proposed changes to the approved Transbay Program on the following resources are discussed in this SEIS/EIR:

- Transportation
- Land Use and Planning, Wind, and Shadow
- Socioeconomics, Population, and Housing
- Visual Quality/Aesthetics
- Historic and Cultural Resources
- Biological Resources
- Water Resources and Water Quality
- Geology, Soils, and Seismicity
- Hazardous Materials
- Electromagnetic Fields
- Noise and Vibration
- Air Quality
- Greenhouse Gases and Climate Change
- Public Services, Community Services, and Recreational Facilities
- Safety and Security
- Utilities
- Environmental Justice Communities
- Section 4(f) Evaluation (Public Parks, Recreation Lands, Historic Sites, and Wildlife and Waterfowl Refuges)

As discussed in Chapter 2, Project Alternatives, this SEIS/EIR evaluates proposed refinements to Phase 2 of the Transbay Program, including Downtown Rail Extension (DTX), and other transportation improvements. Land development opportunities at sites not fully used by transportation facilities are not included as part of the proposed action for NEPA analysis, since FTA would have no role in funding or approving this development. However, because the TJPA is collaborating with the City to promote development at these locations, adjacent land development is considered to be part of the CEQA project.

The features of the approved Transbay Program that would be affected by the proposed project, and that are addressed in this SEIS/SEIR, are the DTX, track curvature entering the Transbay Transit Center (Transit Center), extension of the below-grade rail levels of the Transit Center to accommodate HSR requirements, realignment of the underground Fourth and Townsend Street Station, and other transportation improvements necessary for implementing the Transbay Program and enhancing connectivity to the regional rail and bus services that will be available at the Transit Center. For a

complete list of all proposed project components, refer to Table 2-3 and Figure 2-6 in Chapter 2. These project components are collectively referred to as the "proposed project."

This SEIS/EIR provides environmental analysis of the proposed changes to the approved Transbay Program and incorporates new information about physical and socioeconomic conditions in the study area to supplement the 2004 FEIS/EIR. Construction-related impacts and operational/post-construction direct and indirect impacts and mitigation measures associated with proposed project components are addressed in each resource section.

3.1.2 Organization of the Analysis

For each resource section, the analysis is presented as follows:

- "Introduction" provides a brief description of the resource topic, key issues, and related background reports or studies.

- "Affected Environment" describes the existing environmental setting, or existing conditions, for the resource, as well as the regulatory framework that governs the resource. For some resources, a "study area" is defined and considered in the analysis that may vary from the "project area." For example, the study area for cultural resources is decided using federal guidelines; the study area for visual resources is defined by the relevant viewsheds and key observer viewpoints; and the study area for traffic is defined by the travel characteristics of motorists, bicyclists, and pedestrians related to the proposed project. The study area, if applicable, is defined in each section, and varies based on the resource being considered.

- "Environmental Consequences and Mitigation Measures" identifies thresholds used to evaluate the intensity, magnitude, and significance of the project alternatives' impacts; the methodological approach to the analysis as necessary; and those issues where neither alternative (the No Action Alternative or the proposed project) would have an impact and would not warrant further analysis.

  The majority of this subsection is dedicated to an environmental analysis of the project alternatives (No Action Alternative and proposed project). The analysis addresses direct and indirect impacts, as well as long-term operational and temporary construction impacts. As described in Section 2.2.1, No Action Alternative, the No Action Alternative refers to the improvements that will be constructed if the proposed project as described in this SEIS/EIR is not implemented. In other words, if the currently proposed project is not approved, the previously approved Transbay Program Phase 2 components still will be constructed. Thus, the No Action Alternative is the approved Transbay Program, as subsequently modified between 2005 and 2011 by the TJPA and FTA. The No Action Alternative was evaluated in the 2004 FEIS/EIR and subsequent addenda between 2005 and 2011. Impacts of the No Action Alternative are summarized primarily from the 2004 FEIS/EIR as amended. Where mitigation measures were identified in the 2004 FEIS/EIR for adverse effects under NEPA or significant impacts under CEQA, they are summarized and presented here using the mitigation numbering convention of the approved Transbay Program Mitigation Monitoring and Reporting Program (TJPA 2004), which is included in this SEIS/EIR as Appendix C.

  Impacts of the proposed project are presented following the summary of impacts associated with the No Action Alternative. A "summary impact statement" is provided to highlight the anticipated impact, and the supporting analysis follows. Each summary statement is assigned an alpha-numeric designation that identifies the resource (e.g., TR for Transportation) and an impact

number (e.g., 1, 2, 3). Construction impacts are keyed with a "C" before the resource area abbreviation (e.g., Impact C-TR-7). Cumulative impacts are keyed with a "CU" before the resource area abbreviation (e.g., Impact CU-TR-1). As part of the summary impact statement, an indication of the nature, magnitude, and severity of the effect under NEPA and of the significance of the impact under CEQA is provided, as described in Section 3.1.3, Types and Classifications of Impacts.

The proposed project impacts are defined in terms of how changes in construction and implementation of proposed project components would alter existing conditions. The analysis also compares the proposed project with the previously approved project (i.e., the Transbay Program) where such differences are important to understand the context of the proposed project's effects. Because the No Action Alternative is approved and the mitigation measures in the 2004 FEIS/EIR were adopted and incorporated into the Transbay Program, the proposed project analysis assumes that the mitigation measures identified for the No Action Alternative would apply and would be included as part of the proposed project. The proposed project impact analysis describes those specific mitigation measures from the No Action Alternative that would be implemented to address potential impacts of the proposed project.

If the proposed project would result in a new adverse/potentially significant impact or substantial increase in the severity of a significant impact identified in the 2004 FEIS/EIR, feasible mitigation measures to avoid, eliminate, or reduce the adverse/potentially significant impact are identified under a subsection titled "Mitigation Measures." New mitigation measures that were not identified for the No Action Alternative but would apply to the proposed project are numbered to correspond to the impact summary statement number. For example, New-MM-NO-1.1 is the first mitigation measure identified for the first noise and vibration impact, Impact NO-1. Occasionally, there may be an impact that does not require a mitigation measure, but an "Improvement Measure" is suggested for consideration. Such measures are numbered with an "I" to signify "improvement measure," the topic code, and number (e.g., New-I-GE-2.1).

Following the impact analysis for each resource is a summary of the proposed project's NEPA effects and CEQA impacts. This section consists of a table that summarizes the NEPA effect of the proposed project on the resource, as well as individual CEQA impacts in response to Appendix G of the State CEQA Guidelines. The table also compares the effect/impact conclusions to those in the 2004 FEIS/EIR.

This section also includes a cumulative analysis that examines the incremental impact of the proposed project combined with those of other reasonably foreseeable projects.

3.1.3 Types and Classification of Impacts

Direct and indirect operational, construction, and cumulative impacts are evaluated in each of the sections that follow. Direct impacts are the primary effects that are caused by the proposed project, and occur at the same time and place. For the proposed project, direct impacts would be the result of implementing the proposed project components. Indirect impacts are secondary effects that are reasonably foreseeable and caused by the proposed project, but occur at a different time or place. More specifically, as defined by the Council on Environmental Quality (CEQ) regulations CFR, Title 40, Section 1508.8, under NEPA, "indirect effects" are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Temporary construction impacts are those that would occur only during construction of the project, and would cease when the project enters into the

operation phase. Cumulative impacts occur when two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts (see Section 3.1.5, Cumulative Analysis, for further discussion of cumulative projects).

Impacts analyzed pursuant to CEQA are classified as having no impact, a less-than-significant impact, a less-than-significant impact with mitigation, a significant impact, or a beneficial impact. Impacts analyzed pursuant to NEPA are classified as having no effect, no adverse effect, no adverse effect with mitigation, adverse effect, or beneficial effect.

3.1.4 Differences between CEQA and NEPA

This SEIS/EIR was prepared pursuant to the requirements of both NEPA and the CEQ regulations and CEQA and its implementing regulations. The differences between the guidelines for NEPA and CEQA are captured in this SEIS/EIR. For CEQA, the checklist (Appendix G of the CEQA Guidelines) that describes thresholds for determining significance for environmental topics is used.

However, because this SEIS/EIR is a combined CEQA/NEPA document, and since CEQA and NEPA use the term "significant" differently, consideration has also been given to the definition of "significance" that is appropriate for NEPA evaluation. Pursuant to the CEQ NEPA regulations (CFR, Title 40, Sections 1500–1508), the significance of project effects is evaluated in consideration of the proposed federal agency action effects context, intensity, and duration. Context refers to the geographic area (spatial extent) of impact, which varies with the physical setting of the activity and the nature of the resource being analyzed. Intensity refers to the severity of the impact; evaluation of the intensity of an impact considers the sensitivity of the resource and other factors. In EIS documents, FTA does not generally report the level of significance of individual effects, since the decision to prepare an EIS is by itself an indication of a proposed project's potential significant effect on the environment. CEQA, on the other hand, requires a determination of significance for each individual impact analyzed, as well as identification of and mitigation for significant adverse impacts in an EIR. Under NEPA, measures to avoid, minimize, or mitigate effects are considered for all of the adverse impacts of a project, regardless of significance. Another difference between CEQA and NEPA is that CEQA only considers impacts related to the physical environment, while NEPA also obligates federal agencies to consider impacts to the human environment, such as socioeconomic impacts and environmental justice, and costs in their projects.

Another difference in this SEIS/EIR is the definition of the project under CEQA and NEPA for each of the lead agencies. As described in Section 2.2.2 under "Adjacent Land Development under CEQA," the TJPA would be acquiring land for transportation facilities, such as the vent structures and the intercity bus facility. To the extent that an entire property is not needed for the transportation facility, the surplus land would be available for future development. Because these sites would be acquired by TJPA and would be part of the CEQA lead agency's action, the potential future development of the vent structure sites and intercity bus facility for uses other than transportation related would be part of the proposed project, subject to CEQA review. However, this adjacent land development would not be under FTA's jurisdiction, FTA would have no role in funding or approving this development, and, thus, it would not be part of the proposed action for NEPA analysis. This additional development would be evaluated as an indirect effect under NEPA. Indirect effects are further addressed in Section 5.4, Growth Inducement. This SEIS/EIR was prepared in compliance with the more stringent or complete requirements for each resource analyzed, whether they are federal, state, or local. Where possible, criteria are based on local, state, or federal standards. For example, air quality criteria, or thresholds, are based on the state and federal ambient air quality standards, and noise thresholds are based on criteria defined by the Federal Transit Administration. In other cases, such as visual resources, the analysis is based on professional standards.

For impacts determined under NEPA to be adverse, avoidance or mitigation measures are identified to reduce the project's impacts. Similarly, for the CEQA analysis, mitigation is identified to reduce an impact to less than significant, where feasible. Where mitigation would not reduce an impact to less than significant, the impact is identified as significant and unavoidable.

Cumulative Analysis

The discussion of cumulative impacts provides an analysis of cumulative impacts of the proposed project, taken together with other past, present, and reasonably foreseeable future projects producing related impacts. The goal of this analysis is to determine whether the overall long-term impacts of all such projects would be cumulatively significant, and to determine whether the project itself would cause a "cumulatively considerable" incremental contribution to any such cumulatively significant impacts. To determine whether the overall long-term impacts of all such projects would be cumulatively significant, the analysis generally considers the following: (1) the area in which effects of the proposed project will be experienced; (2) the impacts from the proposed project that are expected in the area; (3) other past, proposed, and reasonably foreseeable projects that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other projects; and (5) the overall impact that can be expected if the individual impacts from each project are allowed to accumulate.

"Cumulative impacts" refers to two or more individual effects that, when considered together, are considerable, or that compound or increase other environmental impacts (CEQA Guidelines Section 15355). Cumulative impacts can result from individually minor but collectively significant impacts taking place over time (40 CFR 1508.7). If the analysis determines that there is the potential for the proposed project, taken together with other past, present, and reasonable foreseeable future projects, to result in a significant or adverse cumulative impact, the analysis then determines whether the project's incremental contribution to any significant cumulative impact is itself significant (i.e., "cumulatively considerable").

CEQA Guidelines Sections 15130(b)(1)(A) and 15130(b)(1)(B) provide two methods for approaching the analysis of cumulative impacts: the list approach and the projection approach. Because the proposed project consists primarily of transportation-related improvements that would be implemented over a relatively long period of time, the cumulative analysis is based on the projection approach, and the analysis relies on accepted land use, population, and travel demand projections provided by the City. The relevant area plans, major projects (both land use and transportation related), and large development projects are included in the City's traffic model that forecasts future traffic conditions in 2040 (San Francisco County Transportation Authority 2012). Because of this model's widespread use for a number of projects in the area, it provides a meaningful and appropriate context for the cumulative analysis. In addition, the City's Transit Center District Plan, which was approved in 2012 (City of San Francisco 2012), builds on the San Francisco Downtown Plan and provides a land use, transportation, and public realm vision for the 145 acres that surround the Transit Center. The Transit Center District Plan provides the planning context for how the development pattern, visual landscape, and transportation network will evolve. The Transit Center District Plan also overlaps the Redevelopment Plan component of the 2004 approved Transbay Program. The Transit Center District Plan does not affect or change the development controls or open space components of Zone 1 of the Redevelopment Area, but enacts new policies and land use controls affecting Zone 2 (see Figure 2-1 for location of redevelopment zones).

Similar to the Transit Center District Plan, the City's Central South of Market (SoMa) Plan provides a new vision for an area bound by Market Street on the north, Second Street on the east, Townsend Street to the south, and Sixth Street to the west (City of San Francisco 2013). This plan seeks to reshape the area that will be served by the Central Subway, a vital new transportation link that will connect several San

Francisco neighborhoods, including Chinatown, Union Square, Central SoMa, and the City's southeastern neighborhoods. The Central Subway, which is under construction, will serve as a northern extension of the existing Third Street T Line, and the Central SoMa Plan seeks to capitalize on this transportation investment with supportive transit-oriented growth, improved streets and open spaces, and a more diverse and intense mix of land uses. Together, the City's traffic model, the Transit Center District Plan, and the Central SoMa Plan provide the cumulative context for many of the resources that may be affected by the proposed project.

To supplement the approach for projections in the cumulative analysis and to allow for a complete overview to relevant foreseeable projects, even though they are likely to be encompassed by the above-mentioned forecasts and plans, Table 3.1-1 and Figure 3.1-1 identify other major development projects in the project area. This list includes projects that are likely to result in similar impacts as the proposed project. The list of projects generally includes those in proximity to the project area (i.e., those that could result in overlapping impacts, such as transportation; land use and planning; public services, community services, and recreational facilities; noise and vibration; visual quality/aesthetics; and utilities).

Additional information on each plan or project can be obtained from the source cited in Table 3.1-1.

Table 3.1-1
Reasonably Foreseeable Projects Considered in the Cumulative Impact Analysis

Project Number	Project Name/Location	Project Summary	Project Date	Source
1	350 Bush Street	Demolition of existing buildings, except for the Mining Exchange building, which would be converted to retail use. Construction of a 19-story office building with 20,400 square feet of retail space and 344,540 square feet of office space.	The building permit was reinstated on December 30, 2013.	SF Planning Development Pipeline (updated 12/19/14)
2	Better Market Street	Improvements to redesign Market Street between Octavia Boulevard and The Embarcadero into a pedestrian, bicycle, and transit-oriented street.	Construction is anticipated to start in 2018.	Better Market Street (SF Planning, DPW, SFCTA, SFMTA, SF OEWD)
3	50 First Street	Demolition of four existing structures and construction of three towers, ranging in height from 184 to 915 feet. The proposed towers would accommodate a mix of office (approximately 1.25 million square feet), residential (about 182 dwelling units), retail (approximately 43,000 square feet), and hotel (about 266 rooms), along with a 15,000 square-foot entertainment venue.	The planning application was filed with the Planning Department on June 4, 2014.	SF Planning Development Pipeline (updated 12/19/14)
4	535 Mission Street[1]	Demolition of the existing surface parking lot and construction of an approximately 293,750-square-foot office building with 2,680 square feet of retail and 50 parking spaces. The building would be 296,430 gross square feet, 27 stories, and approximately 378 feet tall.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
5	Second Street Improvement Project	Construction of a separate bicycle lane along Second Street between King and Market Streets.	SF Department of Public Works, SFMTA, and SF Planning Department are currently working with the community for design input and feedback.	San Francisco Department of Public Works
6	350 Mission Street[1]	Demolition of an existing four-story building and construction of a 28-story, approximately 455-foot-tall (plus mechanical space) office tower.	The project is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
7	Transbay Tower, 425 Mission Street[1]	Construction of a 1,200-foot-tall, 80-story, 1,880,000-square-foot office building with 43,000 square feet of retail in three floors, with the uppermost floor connected by a bridge to proposed Transbay Transit Center City Park.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
8	706 Mission Street/Mexican Museum Project	Construction of a new 47-story, 550-foot-tall tower with two floors below grade. The new tower would be adjacent to and physically connected to the Aronson Building which would be restored and rehabilitated as part of the project. The tower would include a mix of residential, museum, restaurant/retail, and possibly office uses.	Construction is anticipated to be completed in 2017.	SF Planning

Table 3.1-1
Reasonably Foreseeable Projects Considered in the Cumulative Impact Analysis

Project Number	Project Name/Location	Project Summary	Project Date	Source
9	181 Fremont Street[1]	Construction of a 66-story office mixed-use high-rise project with 796,933 total gross square feet, with class A office space (floors 2–44), 140 units of residential (floors 47–65), with sky lobby and auto lift-accessed 241-space four-level underground parking.	The building permit was issued on December 26, 2013.	SF Planning Development Pipeline (updated 12/19/14)
10	222 Second Street[1]	Construction of a 25-story office building with public assembly, food/beverage handling, and retail space.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
11	41 Tehama Street[1]	Construction of a 360-foot-tall, 35-story, 402,217-square-foot building with 398 dwelling units. The site is currently a surface parking lot.	The project was issued a "Community Plan Exemption" in November 2013.	SF Planning Development Pipeline (updated 12/19/14)
12	57 Tehama Street	Change of use from industrial warehouse to residential single family dwelling with remodel and expansion of building.	The building permit was filed on April 30, 2014.	SF Planning Development Pipeline (updated 12/19/14)
13	250 Fourth Street	Demolition of an existing three-story office building and construction of a 119-foot-tall, 93,460-square-foot hotel building with 215 guest bedrooms.	The building permit was issued on September 12, 2014.	SF Planning Development Pipeline (updated 12/19/14)
14	900 Folsom Street	Construction of a 396,000-gross-square-foot, nine-story, 300-unit residential mixed-use project located on a 1.3-acre parcel. The project would remove a surface parking lot and two billboards to construct two buildings and 285 parking spaces.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
15	Moscone Convention Center Expansion	Expansion of the Moscone Convention Center by approximately 353,000 square feet to the portion of the existing Moscone Center located on Howard Street between Third and Fourth Streets.	The project application was filed on March 1, 2013.	SF Planning Development Pipeline (updated 2/10/14)
16	280 Beale Street[1]	Construction of 32 stories, 479 condominium units, and retail space.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
17	Central Subway Extension	The Central Subway will provide rail service on Muni's T-Third light-rail line from the intersection of Fourth and King Streets to Union Square and Chinatown. The new, 1.7-mile-long light-rail line will serve regional destinations, including Chinatown, Union Square, Moscone Convention Center, Yerba Buena, South of Market area, and AT&T Park, as well as connect to BART and Caltrain.	Construction is underway, and scheduled to be completed by 2018. Operation is anticipated to begin in 2019.	SFMTA Central Subway Overview

Table 3.1-1
Reasonably Foreseeable Projects Considered in the Cumulative Impact Analysis

Project Number	Project Name/Location	Project Summary	Project Date	Source
18	340 Fremont Street	Demolition of two existing buildings and construction of two residential buildings consisting of up to 355 dwelling units, 2,335 gross square feet, and 336 off-street parking spaces.	The building permit was filed on August 3, 2012.	SF Planning Development Pipeline (updated 12/19/14)
19	201 Folsom Street	Demolition of an existing U.S. Postal Service surface parking lot and construction of a new 38- to 40-story building with 806 residential units, ground-floor retail, and 806 off-street parking spaces for the residential uses.	The building is currently under construction	SF Planning Development Pipeline (updated 12/19/14)
20	45 Lansing Street	Demolition of an existing building and construction of a 40-story mixed-use building with 305 dwelling units, 280 off-street parking spaces, and 1,000 gross square feet of ground-floor retail use.	The project is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
21	399 Fremont Street	Demolition of the existing structure and construction of a new structure that would include a 400-foot-tall tower, 450 dwelling units, and 450 off-street parking spaces.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
22	425 First Street	The project will extend the performance period for the second phase of One Rincon Hill. Phase II of One Rincon will include a 48-story residential tower, 299 dwelling units, and 19 parking spaces.	The project is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
23	Central SoMa Plan	The Plan would rezone the area of San Francisco around the southern portion of the Central Subway transit line, remove land use restrictions to support a greater mix of uses while also emphasizing office uses in the central portion of the Plan area, increase height limits on certain sites, and modify the system of streets and circulation to meet the needs and goals of a dense transit-oriented system.	Preparation of an EIR began in spring 2013	SF Planning
24	598 Brannan Street	Demolition of the existing two-story, 38,200-square-foot industrial building and construction of two office buildings at the site. The buildings would be 160 feet in height.	The project application was filed with the Planning Department on August 23, 2012.	SF Planning Development Pipeline (updated 12/19/14)
25	801 Brannan Street	Demolition of an existing building (Concourse Exhibit Hall) containing 125,000 square feet of space and 280 surface parking spaces and construction of new buildings extending up to 70 feet in height and containing 560 dwellings and 438 off-street parking spaces. This is a joint project with Project #15, 1 Henry Adams Street, below.	The building permit was issued on September 26, 2014.	SF Planning Development Pipeline (updated 12/19/14)
26	610-620 Brannan Street	Demolition of a paved lot and three single-story buildings to construct an approximately 160-foot-tall (620,000–square-foot) office building ("600 Brannan" project) with public open space, PDR uses, street-facing retail, and subsurface parking.	The planning application was approved on June 14, 2014.	SF Planning Development Pipeline (updated 12/19/14)

Table 3.1-1
Reasonably Foreseeable Projects Considered in the Cumulative Impact Analysis

Project Number	Project Name/Location	Project Summary	Project Date	Source
27	1 Henry Adams Street	Demolition of an existing building (Concourse Exhibit Hall) containing 125,000 square feet of space and 280 surface parking spaces and construction of new buildings extending up to 70 feet in height. The new buildings would contain 560 dwellings and 438 off-street parking spaces. This is a joint project with Project #13, 801 Brannan Street, above.	The building permit was issued on July 8, 2014.	SF Planning Development Pipeline (updated 12/19/14)
28	510 Townsend Street	Demolition of an existing building on two adjoining lots and construction of a mixed-use building on the merged lot. The Townsend Street frontage is proposed at seven stories.	The planning application was filed with the Planning Department on August 8, 2014.	SF Planning Development Pipeline (updated 12/19/14)
29	1825 Owens Street	This project is part of the 60.2-acre UCSF Mission Bay Campus site within the Mission Bay South Redevelopment Area, which is part of the larger 303-acre Mission Bay Redevelopment Area in the Mission Bay neighborhood. Construction is currently adding 1,800,500 gross square feet to the campus.	This building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
30	1301 16th Street	Demolition of an existing one-story warehouse and construction of a new seven-story, 276-unit residential building.	The project application was filed with the Planning Department on September 16, 2013.	SF Planning Development Pipeline (updated 12/19/14)
31	718 Long Bridge Street	Construction of a 267-unit, 493,588-square-foot, 160-foot-tall condominium development.	The project is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
32	Pier 48	Development of Seawall Lot 337 and Pier 48 (i.e., Mission Rock) for a mixed-use development, including open space, commercial, residential, retail, and parking.	The project application was filed with the Planning Department on April 23, 2013.	SF Planning Development Pipeline (updated 12/19/14)
33	1000 16th Street	Construction of three-building residential complex including 450 dwelling units, 26,500 gross square feet of ground-floor retail space, and 503 off-street parking spaces.	The building permit was issued on September 7, 2012	SF Planning Development Pipeline (updated 12/19/14)
34	1006 16th Street	Construction of a six-story building with 393 residential units and retail space.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
35	Caltrain Peninsula Corridor Electrification Project (PCEP)	The PCEP would electrify the Caltrain Corridor from the 4th and King Station in SF to the Tamien Station in San Jose, convert diesel-hauled trains to Electric Multiple Unit trains, and increase service up to six Caltrain trains per peak hour per direction by 2019.	The PCEP EIR was certified in January 2015.	Caltrain

Table 3.1-1
Reasonably Foreseeable Projects Considered in the Cumulative Impact Analysis

Project Number	Project Name/Location	Project Summary	Project Date	Source
36	1455 Third Street	Construction of up to 373,487 gross square feet of office development, 7,512 square feet of ground-floor retail space, and 689 off-street parking spaces within three buildings.	The building permit was issued on April 23, 2010.	SF Planning Development Pipeline (updated 12/19/14)
37	1200 17th Street	Demolition of metal warehouses and temporary office buildings, preservation and rehabilitation of a brick office building, adjustment of a lot line to create two lots, and construction of approximately 200 residential units in a four-story building.	The project application was filed with the Planning Department on April 4, 2012.	SF Planning Development Pipeline (updated 12/19/14)
38	1351 Third Street	Construction of the San Francisco Police headquarters and a fire station. The building will be six stories tall.	The building is currently under construction.	SF Planning Development Pipeline (updated 12/19/14)
39	630 Indiana Street	Demolition of the existing structures on the project site and construction of an approximately 114,700- square-foot building with 111 residential units and approximately 1,900 square feet of ground-floor neighborhood-serving retail uses.	The building permit was filed on December 24, 2013.	SF Planning Development Pipeline (updated 12/19/14)
40	800 Indiana Street	Demolition of the existing Opera Warehouse and construction of a 340-unit multi-family building and 230 parking spaces. The project would be constructed in three buildings with an underground parking garage.	The project was issued a "Community Plan Exemption" in December 2014.	SF Planning Development Pipeline (updated 12/19/14)
41	1395 22nd Street	Construction of a mixed-use building with 251 dwelling units, 29,780 square feet of PDR, and 205 off-street parking spaces.	The project application was filed with the Planning Department on January 13, 2014.	SF Planning Development Pipeline (updated 12/19/14)
42	Golden State Warriors Arena	Construction of a multi-purpose event center as well as office, retail, open space and structured parking on an 11-acre site within the Mission Bay South Redevelopment Plan Area of San Francisco.	Subsequent EIR was certified December 8, 2015.	http://sfocii.org/warriors-draft

Notes:
BART = Bay Area Rapid Transit
DPW = San Francisco Department of Public Works
Muni = San Francisco Municipal Railway
SF = San Francisco
SFMTA = San Francisco Municipal Transportation Agency
SoMa = South of Market
SFOEWD = San Francisco Office of Economic and Workforce Development
[1] This project is located within the boundary of the previously approved Transit Center District Plan (City of San Francisco 2012).

Source: City and County of San Francisco 2014; compiled by AECOM in 2015

Figure 3.1-1 Cumulative Projects

3.2 TRANSPORTATION

3.2.1 Introduction

The section describes the transportation system and facilities in the vicinity of the proposed project. This transportation network includes the roadways, key intersections, transit routes, pedestrian and bicycle pathways, parking, loading zones, and emergency vehicle access. The analysis examines potential impacts on the transportation network as a result of construction and operation of the proposed project components. In particular, the analysis focuses on proposed activities and locations of these components and how transportation conditions have changed since approval of the 2004 FEIS/EIR.

3.2.2 Affected Environment

Roadway Network

Within the South of Market (SoMa) area of San Francisco, streets are configured into a dense grid of general northbound/southbound and eastbound/westbound roadways (see Figure 3.2-1). Only the streets that would be potentially affected by each of the proposed project components are described below.

Mission Street is a major roadway that traverses San Francisco, running from The Embarcadero through SoMa into Daly City, where it becomes El Camino Real. In the project area, it operates as a two-way arterial with two travel lanes in each direction. One lane in each direction between Main Street and Eleventh Street is designated for use by bus and taxi only on weekdays, between the hours of 7 a.m. and 6 p.m.

Howard Street is a major east/west roadway in downtown San Francisco running from The Embarcadero through SoMa to South Van Ness Avenue. Between The Embarcadero and Fremont Street, Howard Street operates as a two-way arterial with two travel lanes in each direction. West of Fremont Street, Howard Street is one-way westbound, providing four travel lanes.

Harrison Street is a major east/west roadway in the SoMa area between The Embarcadero and Norwich Street (located south of Cesar Chavez Street). On the segment between Second Street and Third Street, Harrison Street provides three westbound travel lanes and two eastbound travel lanes. West of Third Street, Harrison Street switches to one-way (westbound) operation, with four to five travel lanes.

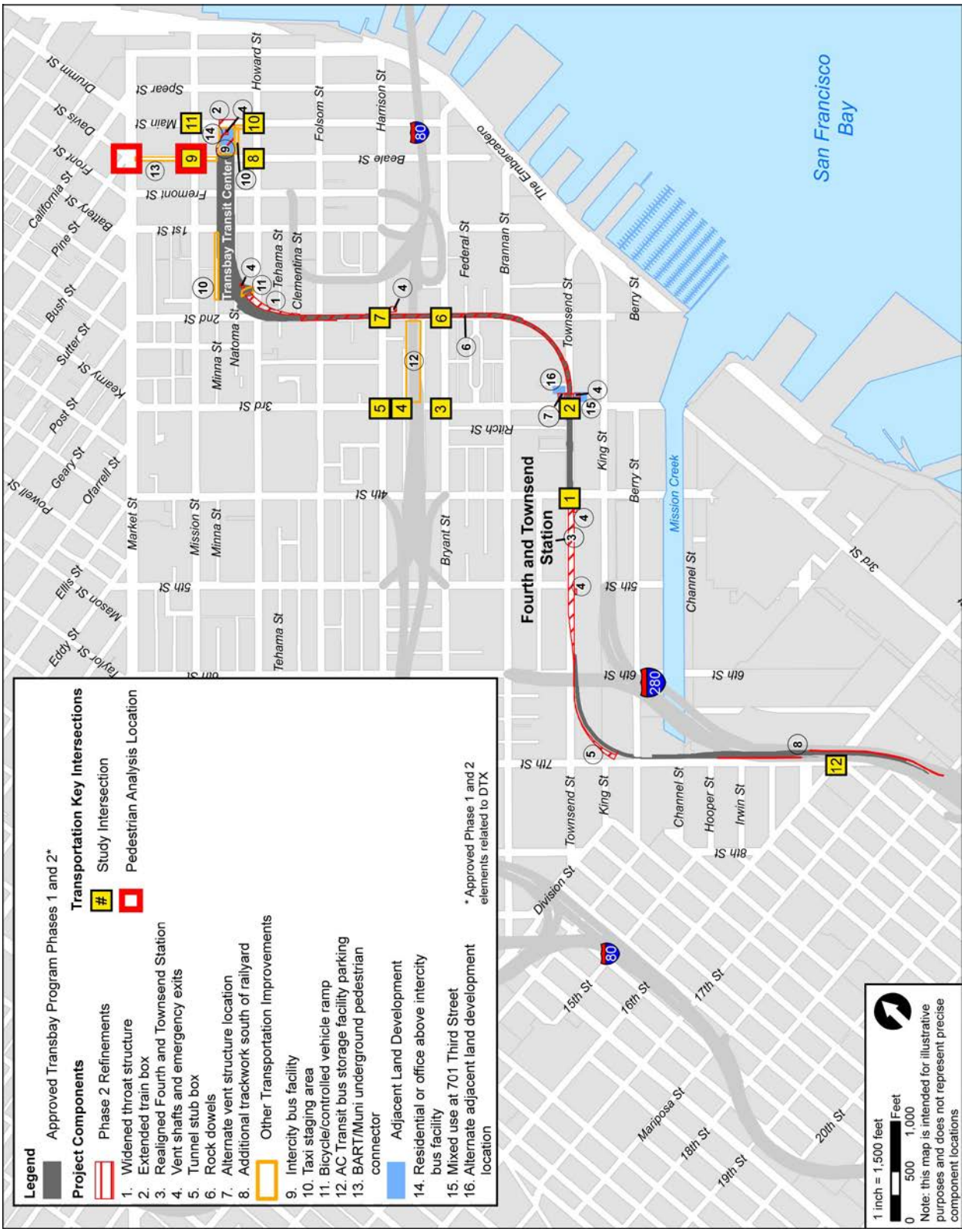
Bryant Street is an east/west street that runs between The Embarcadero and Cesar Chavez Street. In the project area, Bryant Street is one-way eastbound, providing four travel lanes.

Townsend Street is an east/west street that runs between The Embarcadero and Eighth Street. In the project area, it operates as a two-way roadway, providing between one and two travel lanes in each direction.

Main Street is a north/south street that runs between Market Street and Bryant Street. In the project area, Main Street is one-way northbound, providing three travel lanes.

Beale Street is a north/south street that runs between Market Street and Bryant Street, ending in a cul-de-sac south of Bryant Street. In the project area, Beale Street is one-way southbound, providing two travel lanes and a bus/taxi-only lane.

Second Street is a two-way north/south street that runs between King Street and Market Street. In the project area, Second Street has two travel lanes in each direction.



Sources: City and County of San Francisco 2013b; data compiled by AECOM in 2014

Figure 3.2-1 Local Street Network and Study Area Intersections

Third Street is a north/south street running through the downtown, Mission Bay, Potrero Point, Dogpatch, and Bayview-Hunters Point neighborhoods. In the project area, it operates as a one-way northbound street with four travel lanes.

Fourth Street is a north/south street running through the downtown and Mission Bay areas. North of Townsend Street, Fourth Street operates as a one-way southbound street with four travel lanes. South of Townsend Street, Fourth Street provides two northbound travel lanes and three southbound travel lanes.

Seventh Street is a north/south street running from Market Street in Downtown San Francisco to 16th Street in Mission Bay adjacent the at-grade railroad crossing. South of King Street, Seventh Street runs parallel to the Caltrain tracks on the west side. North of Brannan Street, Seventh Street operates as a one-way facility in the northbound direction, with four travel lanes. South of Brannan Street, Seventh Street is a two-way facility generally with one lane in each direction and a Class 2 bicycle facility.

16th Street is a two-way east/west street that runs between Terry A. Francois Boulevard in the Bayshore neighborhood to the east and Flint Street in the Castro neighborhood to the west. 16th Street is generally a four lane roadway with Class 2 and Class 3 bicycle facilities and intersects with Seventh Street in Mission Bay adjacent to the 16th Street at-grade railroad crossing.

Intersection Operations

Intersection operating conditions were analyzed at 12 study intersections based on their proximity to proposed project components and the potential for a given component to affect intersection operations. Each of the 12 study intersections was analyzed for the weekday PM peak hour (generally 4:30 p.m. to 5:30 p.m.) of the evening peak period (4 p.m. to 6 p.m.). In addition, eight of the intersections were analyzed for the weekday AM peak hour (generally 7:30 a.m. to 8:30 a.m.) of the morning peak period (7 a.m. to 9 a.m.) because of the potential for future land use development to occur adjacent to some of the proposed project components and to generate a substantial amount of new trips during the morning commute period. All study intersections, except one, involved field observations and turning movement counts collected in December 2012; the exception is Intersection 12, for which data were available in the Peninsula Corridor Electrification Project (PCEP) Final EIR (Peninsula Corridor Joint Powers Board 2015). The analysis locations, including the time periods studied, are listed by associated proposed project component, below, and shown in Figure 3.2-1.

Analysis locations associated with the proposed vent structure at 701 Third Street, the alternate vent structure site at 699 Third Street and 180 Townsend Street, and adjacent land development:

1. Fourth Street/Townsend Street (both peak hours)
2. Third Street/Townsend Street (both peak hours)

Analysis locations associated with the proposed vent structure at the Second Street/Harrison Street intersection and AC Transit bus storage facility parking:

3. Third Street/Bryant Street (PM peak hour only)
4. Third Street/Perry Street (PM peak hour only)
5. Third Street/Harrison Street (both peak hours)
6. Second Street/Bryant Street (PM peak hour only)
7. Second Street/Harrison Street (PM peak hour only)

Analysis locations associated with the proposed intercity bus facility and adjacent land development, and taxi queuing area:

8. Beale Street/Howard Street (both peak hours)
9. Beale Street/Mission Street (both peak hours)
10. Main Street/Howard Street (both peak hours)
11. Main Street/Mission Street (both peak hours)

Analysis location associated with the proposed additional trackwork south of the Caltrain railyard:

12. 16th Street crossing of Caltrain tracks/Seventh Street (both peak hours)

Intersection level of service (LOS) is a qualitative description of the performance of an intersection based on the average delay per vehicle. All study intersections were evaluated using the 2000 Highway Capacity Manual (HCM) methodology.[1] For signalized intersections, this methodology determines the capacity of each lane group approaching the intersection and calculates an average delay (in seconds per vehicle) for each of the various movements at the intersection. A combined weighted average delay and LOS are then presented for the intersection. For unsignalized intersections, the average delay and LOS for the worst stop-sign-controlled approach at the intersection is presented. Intersection LOS ranges from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. LOS definitions for signalized and unsignalized intersections are shown in Table 3.2-1. In San Francisco, LOS A through LOS D are considered excellent to satisfactory levels of service, and LOS E and LOS F represent unacceptable levels of service, as specified in the San Francisco Planning Department's Transportation Impact Analysis Guidelines for Environmental Review.[2]

Table 3.2-1
Intersection Levels of Service Criteria and Definitions

LOS	Description	Average Delay (seconds per vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Little or no delay	< 10.0	< 10.0
B	Short traffic delay	> 10.0 and < 20.0	> 10.0 and < 15.0
C	Average traffic delay	> 20.0 and < 35.0	> 15.0 and < 25.0
D	Long traffic delay	> 35.0 and < 55.0	> 25.0 and < 35.0
E	Very long traffic delay	> 55.0 and < 80.0	> 35.0 and < 50.0
F	Extreme traffic delay	> 80.0	> 50.0
Source: Transportation Research Board 2000			

Existing intersection LOS for the 12 study intersections are shown in Table 3.2-2. As shown, the Second Street/Bryant Street and Beale Street/Howard Street intersections operate at an unacceptable LOS E during the weekday PM peak hour and the 16th Street/Caltrain crossing (at Seventh Street) operates at an

[1] Adjustments are typically made to the capacity of each intersection to account for various factors that reduce the ability of the streets to accommodate vehicles (such as the downtown nature of the area, number of pedestrians, bus stops, vehicle types, lane widths, grades, on-street parking, and queues).

[2] Delay for intersections operating at LOS F is typically reported as "greater than 80 seconds" for signalized intersections and "greater than 50 seconds" for unsignalized intersections, as 80 seconds and 50 seconds are generally considered the limits of the meaningful range for the analysis methodology for signalized and unsignalized intersections. However, since a substantial percentage of the analysis locations are projected to operate at LOS F under future-year scenarios, the volume-to-capacity ratio is also reported in cases where the intersection average delay is greater than these limits, to facilitate comparison between scenarios.

unacceptable LOS E during the weekday AM peak hour. All other remaining study intersections operate at acceptable LOS D or better during both weekday AM and PM peak hours.

Table 3.2-2
Existing Intersection Levels of Service in the Proposed Project Area

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay[1]	LOS	Delay[1]
1. Fourth Street/Townsend Street	Signal	B	16.7	B	18.0
2. Third Street/Townsend Street	Signal	B	15.9	C	24.2
3. Third Street/Bryant Street	Signal	--	--	D	37.6
4. Third Street/Perry Street	OWSC[2]	--	--	B	11.6
5. Third Street/Harrison Street	Signal	C	22.0	C	30.3
6. Second Street/Bryant Street	Signal	--	--	**E**	**64.8**
7. Second Street/Harrison Street	Signal	--	--	D	48.4
8. Beale Street/Howard Street	Signal	B	11.7	**E**	**61.1**
9. Beale Street/Mission Street	Signal	B	16.8	C	33.9
10. Main Street/Howard Street	Signal	B	15.7	C	27.6
11. Main Street/Mission Street	Signal	B	10.3	B	10.4
12. 16th Street/Caltrain Tracks (at Seventh Street)	Signal	**E**	**67.3**	D	49.5

Notes:
Bold indicates intersection operating at unacceptable LOS (LOS E or LOS F).
[1] Delay is presented in seconds per vehicle.
[2] OWSC = one-way stop control. Delay is presented for the worst minor approach to the intersection.
Source: Compiled by AECOM in 2014; Peninsula Corridor Joint Powers Board 2015

Pedestrian Operations

Pedestrian facilities (including sidewalks, crosswalks, and pedestrian signals) are generally provided along all streets and intersections throughout the SoMa area. During peak periods, pedestrian activity is generally high throughout the SoMa area, with the highest levels of activity occurring along Market Street and near major transit facilities.

Pedestrian crosswalk counts were conducted in December 2012 at the Beale Street/Market Street and Beale Street/Mission Street intersections during the weekday midday (12 noon to 3 p.m.) and evening peak (4 p.m. to 6 p.m.) periods. These intersections were selected because they would be most affected by the proposed BART/Muni underground pedestrian connector; all other proposed project components are expected to generate relatively few additional pedestrians or would not be expected to substantially alter pedestrian circulation.

The analysis evaluated the operation of pedestrian facilities during the peak 15-minute intervals of the weekday midday and PM peak periods. The operational performance of the crosswalks and street corners was evaluated using the 2000 HCM methodology, an LOS-based methodology. Similar to intersection operations, the performance of pedestrian facilities ranges from LOS A, indicating free pedestrian flow, to LOS F, indicating congested conditions. In San Francisco, LOS E and LOS F represent unacceptable levels of service. The HCM methodology for crosswalks and street corners is shown in Table 3.2-3, and the results for the Beale Street intersections are shown in Table 3.2-4 and Table 3.2-5.

As shown in Table 3.2-4, all study crosswalks operate at acceptable LOS D or better during the weekday midday and PM peak hours. Similarly, as shown in Table 3.2-5, all study street corners operate at acceptable LOS D or better during the weekday midday and PM peak hours.

Table 3.2-3
Crosswalk and Street Level of Service Criteria and Definitions

LOS	Crosswalk Circulation Area (square feet per pedestrian)	Street Corner Circulation Area (square feet per pedestrian)
A	> 60	> 13
B	> 40 and ≤ 60	> 10 and ≤ 13
C	> 24 and ≤ 40	> 6 and ≤ 10
D	> 15 and ≤ 24	> 3 and ≤ 6
E	> 8 and ≤ 15	> 2 and ≤ 3
F	≤ 8	≤ 2

Source: Transportation Research Board 2000

Table 3.2-4
Existing Crosswalk Levels of Service along Beale Street (2012)

Intersection	Crosswalk	Midday Peak Hour		PM Peak Hour	
		LOS	Circ. Area[1]	LOS	Circ. Area[1]
1. Beale Street/Market Street	North	A	79.7	A	88.3
	East	A	116.2	A	164.9
	South	A	65.6	A	101.6
	West	A	371.5	A	201.4
2. Beale Street/Mission Street	North	B	51.8	A	65.3
	East	A	81.7	C	24.4
	South	B	55.1	B	59.7
	West	B	54.5	D	21.8

Note:
[1] Circulation area in square feet per pedestrian.
Source: Compiled by AECOM in 2014

Transit Operations

The proposed project area is served by local and regional public transit services. Service area summaries for each of the major transit providers are outlined below.

Local Transit. SFMTA's Muni provides service within San Francisco, including bus, light rail (Metro), streetcar, and cable car lines. Within the vicinity of the proposed project, Muni currently operates 41 routes, with peak-period headways ranging between 4 and 15 minutes.

Table 3.2-5
Existing Street Corner Levels of Service along Beale Street (2012)

Intersection	Corner	Midday Peak Hour		PM Peak Hour	
		LOS	Circ. Area[1]	LOS	Circ. Area[1]
1. Beale Street/Market Street	Northeast	A	129.9	A	161.9
	Southeast	A	44.4	A	69.4
	Southwest	A	64.5	A	79.7
	Northwest	A	207.6	A	187.1
2. Beale Street/Mission Street	Northeast	A	16.1	A	7.6
	Southeast	A	18.5	A	11.0
	Southwest	A	14.8	A	8.2
	Northwest	B	12.9	C	7.6

Note:
[1] Circulation area in square feet per pedestrian.
Source: Compiled by AECOM in 2014

East Bay. Transit service to and from the East Bay is primarily provided by BART and AC Transit. BART operates regional rail transit service between the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton, and Fremont) and San Francisco, and between San Mateo County (Millbrae and San Francisco International Airport) and San Francisco. The nearest BART stations to the proposed project area are the Embarcadero Station and the Montgomery Station, with multiple station entrances along Market Street between Montgomery Street and Spear Street. AC Transit is the primary bus operator for the East Bay, including Alameda and western Contra Costa Counties. AC Transit operates bus routes between the East Bay and San Francisco, almost all of which currently terminate at the Temporary Transbay Terminal.

Supplementary transit service to/from the East Bay is provided by the following operators:

- Alameda/Oakland Ferry: Ferry service between the Ferry Building (The Embarcadero/Market Street), Oakland's Jack London Square, and the Alameda Ferry Terminal
- Alameda Harbor Bay Ferry: Ferry service between the Ferry Building and the Harbor Bay Parkway Ferry Terminal on Harbor Bay Isle
- Vallejo Baylink: Ferry and supplementary express bus service between the Ferry Building and the Vallejo Ferry Terminal
- Western Contra Costa Transit Authority: Lynx express bus service between Hercules and the Transbay Terminal

South Bay/Peninsula. Transit service to and from the South Bay and Peninsula is provided by BART, SamTrans, and Caltrain. SamTrans provides bus service between San Mateo County and San Francisco, including bus lines that serve San Francisco and the downtown area. In general, SamTrans service to downtown San Francisco operates along Mission Street to the Temporary Terminal. Caltrain provides commuter rail passenger service between Santa Clara County and San Francisco, operating a combination of express and local service on weekdays. The San Francisco Caltrain terminal is located at the intersection of Fourth Street and King Street in the Mission Bay area.

North Bay. Transit service to and from the North Bay is primarily provided by Golden Gate Transit buses and ferries. Between the North Bay and San Francisco, Golden Gate Transit operates a combination of commute and basic bus routes, most of which serve the Financial District and Civic Center. Golden Gate Transit buses use a parking and storage lot at the Eighth Street/Harrison Street intersection. Golden Gate Transit also operates ferry service between the North Bay and San Francisco. During the morning and evening commute periods, ferries run between Larkspur and San Francisco and between Sausalito and San Francisco. Additional ferry service operated by Blue & Gold Fleet connects Tiburon and San Francisco. The San Francisco terminal for North Bay commute ferry service is located at the Ferry Building.

All regional transit providers can be accessed within the proposed project area on foot or from nearby Muni bus and light rail service.

According to the Transit Data for Transportation Impact Studies memorandum (City and County of San Francisco 2013a), Muni routes to and from the greater downtown area are approximately 72 percent utilized during the weekday AM peak hour and 68 percent utilized during the weekday PM peak hour. Regional transit providers connecting the East Bay Area with San Francisco (i.e., BART, AC Transit, ferries) are approximately 85 percent utilized during the weekday AM peak hour and 83 percent utilized during the weekday PM peak hour. Regional transit providers connecting the North Bay Area with San Francisco (i.e., Golden Gate Transit bus, ferries) are approximately 54 percent utilized during the weekday AM peak hour and 49 percent utilized during the weekday PM peak hour. Regional transit providers connecting the South Bay Area with San Francisco (i.e., BART, Caltrain, SamTrans) are approximately 71 percent utilized during the weekday AM peak hour and 72 percent utilized during the weekday PM peak hour. Transit data are provided for the peak direction of travel (to downtown San Francisco during the weekday AM peak hour and from downtown San Francisco during the weekday PM peak hour).

Bicycle Facilities

Seven major Citywide bicycle routes are in the proposed project area, consisting of Class II bikeways (i.e., striped, on-street bicycle lanes) and Class III bikeways (i.e., bicycle routes where bicyclists share the road with automobiles):

Route 5 is a major north/south Class II/III bikeway stretching through San Francisco's southeastern, eastern, and northeastern neighborhoods. In the vicinity of the proposed project area, Route 5 is a Class II facility along The Embarcadero, continuing north to North Point Street, where it connects to Route 2.

Route 11 is a north/south Class III facility, running from Columbus Avenue at North Point Street in the Fisherman's Wharf area along Columbus Avenue, Sansome Street (northbound)/Battery Street (southbound), and Second Street to King Street in the Mission Bay area.

Route 16 is an east/west Class II/III facility, running from Market Street along the Sutter Street/Post Street couplet to Presidio Avenue in the Laurel Heights area. In the vicinity of the project area, Route 16 is a Class III facility.

Route 19 is a north/south Class III facility running along Fifth Street from Market Street to Townsend Street.

Route 30 is an east/west mixed Class I/II/III facility that runs from The Embarcadero along Howard Street (westbound)/Folsom Street (eastbound) and 14th Street or Market Street to the Castro area. In the

project area, westbound Route 30 is a Class III facility east of Fremont Street. All other portions of Route 30 in the proposed project area are Class II facilities.

Route 36 is an east/west Class II facility running along Townsend Street from The Embarcadero to Folsom Street.

Route 50 is an east/west primarily Class III facility that runs the length of Market Street from The Embarcadero to Castro Street. From there, Route 50 continues along Corbett Street, Portola Avenue, and Sloat Boulevard to the Great Highway.

There is a moderate level of bicycle activity in the proposed project area, primarily concentrated along the designated bicycle routes, especially along Market Street and The Embarcadero. Bicycle traffic is highest during the morning and evening peak periods, and there is generally a steady stream of bicycle traffic along Market Street during these times as workers commute to/from their place of employment by bicycle. Bicycle activity along The Embarcadero is higher during midday and off-peak periods, as this facility is more geared to recreational and tourist use. During other times of the day and along other bikeways and streets, bicycle traffic is generally lower. A bicycle share station is located at the Embarcadero BART Station. The proposed project is not expected to substantially affect bicycle travel demand or to alter the use or operation of bicycle share stations in the project vicinity.

On-Street Parking Conditions

Within the proposed project area, on-street parking generally consists of metered or time-limited parking. Most of the metered parking is limited to 15 minutes or 1 hour. Some metered spaces operate between 7 a.m. and 3 p.m., Monday through Friday, with a "No Stopping" restriction in place between 3 p.m. and 6 p.m. on weekdays. In addition, during the weekday morning and evening peak commute periods (7 a.m. to 9 a.m. and 3 p.m. to 6 p.m.), on-street parking is prohibited along many key roadways in the area, such as Mission Street, First Street, and Fremont Street.

Based on field observations, on-street parking was nearly fully occupied throughout the day; the highest occupancy rates were observed closer to Market Street and lower occupancy rates were observed toward the southern portion of the proposed project area near Harrison, Bryant, and Brannan Streets.

In addition to the on-street parking in the project corridor, off-street parking is at the west end of the Caltrain railyard that is for employees only.

Loading Conditions

Throughout the proposed project area, passenger (white) loading zones are provided near buildings to allow drivers to drop-off or pick-up passengers along the curb. In general, the passenger loading zones have relatively high turnover, due to limited time restrictions.

On-street commercial (yellow) loading zones are provided to allow commercial vehicles (typically trucks and service vehicles) to park along the curb to unload or load goods. These spaces are frequently used by building service vehicles and contractors maintaining buildings that have no off-street parking. Commercial loading zones in the proposed project area are generally regulated by meters with a 1-hour time limit, in effect Monday through Friday (or Saturday), with various start and end times. Based on field observations, on-street loading zone occupancy varies between 50 percent and 75 percent throughout the day. Generally, higher loading zone occupancy occurs closer to Market Street and lower occupancy rates occur toward the southern portion of the proposed project area near Harrison, Bryant, and Brannan

Streets. Additionally, periods of higher usage are concentrated in the early mornings (primarily deliveries to restaurants and stores) and during the midday period (primarily package and mail deliveries).

Emergency Vehicle Access

The existing roadway network enables emergency vehicle response to all buildings in the proposed project area. Although turning radius and maneuverability is somewhat restricted on some roadways, larger emergency vehicles such as ladder trucks can still access these buildings. During peak commute times, general traffic congestion throughout the proposed project area, especially along key streets that provide access to and from Interstate 80, can result in delays to emergency vehicle response.

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning transportation services and facilities, including new guidance issued since the 2004 FEIS/EIR.

Federal

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)

Under SAFETEA-LU, Public Law 109-59 and amendments to the 23 USC and 49 USC, the legislation outlines measures to improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment. SAFETEA-LU promotes more efficient and effective federal surface transportation programs by focusing on transportation issues of national significance, while giving State and local transportation decision makers more flexibility for solving transportation problems in their communities. SAFETEA-LU includes the following eight core program for targeted investments in transportation: Safety, Equity, Innovative Finance, Congestion Relief, Mobility and Productivity, Efficiency, Environmental Stewardship, and Environmental Streamlining.

Moving Ahead for Progress in the 21st Century (2012)

Under MAP-21, Public Law 112-141 and amendments to the 23 USC, the legislation outlines surface transportation funding program totaling $105 billion for FY2013 and FY2014. MAP-21 creates a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. These challenges include improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery. MAP-21 builds on and refines many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

State

Senate Bill 743 and Public Resources Code 21099

SB 743 added Section 21099 to the Public Resources Code, eliminating the analysis of parking impacts for certain urban infill projects under CEQA. The proposed project meets the definition of an infill project located within a transit priority area, as specified by Section 21099. Accordingly, from a CEQA perspective, parking is discussed for informational purposes. Regardless, because the proposed project and the No Action Alternative would be subject to NEPA, parking impacts are considered in this analysis.

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts related to transportation facilities and operations, and to avoid or mitigate those impacts when feasible.

Local

Planning Department of the City and County of San Francisco

The San Francisco Planning Department published the Transportation Impact Analysis Guidelines for Environmental Review (2002) to guide preparation of transportation impact analysis for environmental evaluation. These guidelines provide significance criteria for analyzing the impact of a project on traffic, Muni transit, regional transit, parking, pedestrian and bicycle facilities, freight loading and service, and passenger loading zones.

San Francisco General Plan

The Transportation Element of the San Francisco General Plan is composed of nine sections that define and relate the components of the City's transportation system: General, Regional Transportation, Congestion Management, Vehicle Circulation, Transit, Pedestrians, Bicycles, Citywide Parking, and Goods Movement.

San Francisco Transit First Policy

The Transit First Policy was first adopted by the Board of Supervisors in 1973 and incorporated into the City Charter in 1998 by the voters of San Francisco. The purpose of the Transit First Policy is to ensure the City's commitment to give priority to alternative modes of transportation over personal vehicles through the following defined principles:

1. To ensure quality of life and economic health in San Francisco, the primary objective of the transportation system must be the safe and efficient movement of people and goods.

2. Public transit, including taxis and vanpools, is an economically and environmentally sound alternative to transportation by individual automobile. Within San Francisco, travel by public transit, by bicycle, and on foot must be an attractive alternative to travel by private automobile.

3. Decisions regarding the use of limited public street and sidewalk space shall encourage the use of public right-of-ways by pedestrians, bicyclists, and public transit, and shall strive to reduce traffic and improve public health and safety.

4. Transit priority improvements, such as designated transit lanes and streets and improved signalization, shall be made to expedite the movement of public transit vehicles (including taxis and vanpools) and to improve pedestrian safety.

5. Pedestrian areas shall be enhanced wherever possible to improve the safety and comfort of pedestrians and to encourage travel by foot.

6. Bicycling shall be promoted by encouraging safe streets for riding, convenient access to transit, bicycle lanes, and secure bicycle parking.

7. Parking policies for areas well-served by public transit shall be designed to encourage travel by public transit and alternative transportation.

8. New transportation investment should be allocated to meet the demand for public transit generated by new public and private commercial and residential developments.

9. The ability of the City and County of San Francisco to reduce traffic congestion depends on the adequacy of regional public transportation. The City and County of San Francisco shall promote the use of regional mass transit and the continued development of an integrated, reliable, regional public transportation system.

10. The City and County of San Francisco shall encourage innovative solutions to meet public transportation needs wherever possible and where the provision of such service will not adversely affect the service provided by Muni (*added November 1999*).

Better Streets Plan

The Better Streets Plan is an effort by the City to design a street system to promote the use and enjoyment of public spaces for all. Similar to the Transit First Policy, the Better Streets Plan prioritizes walking, bicycling, transit, and the use of streets as public spaces for all. The Better Streets Plan focuses on streetscape design, traffic-calming measures, and best practice models to ensure multi-modal safety with emphasis on pedestrian well-being.

San Francisco Bicycle Plan

The San Francisco Bicycle Plan, approved in June 2009, includes minor changes to the existing facilities near the proposed project. Improvements, including markings, signage, and facilities, are considered treatments necessary to improve conditions for bicycle use.

3.2.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

- Substantially increase hazards due to a design feature or incompatible uses.

- Result in inadequate emergency access.

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

To determine whether the proposed project would meet the conditions listed above, the San Francisco Planning Department uses the following significance thresholds from its Transportation Impact Analysis Guidelines for Environmental Review:

- For signalized intersections, cause the intersection level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F.

- For unsignalized intersections, cause the level of service at the worst approach to deteriorate from LOS D or better to LOS E or F, and cause California Department of Transportation (Caltrans) peak-hour traffic volume signal warrants to be met, or would cause Caltrans signal warrants to be met when the worst approach is already operating at LOS E or F.

- For intersections that operate at LOS E or F under existing conditions, cause a substantial contribution to the worsening of the average delay per vehicle.

- Cause major traffic hazards or contribute considerably to cumulative traffic increases that would cause deterioration in levels of service to unacceptable levels.

- Cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service, or cause a substantial increase in delays or operating costs such that significant adverse impacts in transit service levels could result. With the Muni and regional transit analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the peak hour.

- Result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

- Create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

- Result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones, and create potentially hazardous conditions or significant delays affecting traffic, transit, bicycles, or pedestrians.

- Result in inadequate emergency access.

Methodology

This transportation evaluation was prepared consistent with the City and County of San Francisco Planning Department's Transportation Impact Analysis Guidelines for Environmental Review (2002) (Transportation Guidelines) and the methodologies and assumptions in the 2004 FEIS/EIR (FTA 2004).

In particular, the following scenarios were evaluated to identify the potential transportation impacts of the proposed project:

- Existing conditions
- Existing-plus-project conditions
- 2040 cumulative conditions

To determine the effects of potential new development associated with the proposed project on the surrounding transportation network, travel demand estimates for the each of the proposed project components were estimated and compared to uses that would be displaced from the site. Travel demand refers to the new vehicle, transit, pedestrian, and other trips that would be generated by the proposed project. The travel demand estimates were based on information contained in the Transportation Guidelines and the travel demand methodology developed for the Transit Center District Plan FEIR (City of San Francisco 2012). The 2040 Cumulative Conditions were developed using output from the San Francisco County Transportation Authority's travel demand model (the "SF Model"),[3] and data provided in the Transbay Program Final EIS Reevaluation (FRA 2010). Specifically, roadway volumes for the SF Model's base year (2012) and future horizon year (2040) were determined, and then annual growth rates for each street were calculated.

To account for changed roadway conditions in the area as proposed as part of the approved Transit Center District Plan and the proposed Central SoMa Plan, manual adjustments were conducted at the affected movements. These growth rates were then applied to the 2012 intersection turning movement counts at each of the study intersections. Then, traffic volume adjustments associated with the California High-Speed Rail (HSR) Authority's identified in the Transbay Program Final EIS Reevaluation (FRA 2010), and construction of the Transit Center train box and the Downtown Rail Extension (DTX) were applied to study intersections to derive 2040 Cumulative Conditions for the weekday AM and PM peak hours. These adjustments account for travel behavior changes associated with adjusted Muni and Caltrain services, as well as the availability of the HSR.

Background growth in pedestrian traffic within the proposed project area was derived from the SF Model neighborhood trip tables using the growth in pedestrian trips projected for the model's "Downtown" and "SoMa" aggregated neighborhoods, and from data provided in the Transbay Program Final EIS Reevaluation (FRA 2010). Pedestrian traffic generated by the extension of Caltrain into the Transit Center derived from the Cambridge Systematics model of Caltrain passenger walk trips to/from the Transit Center was modified per the new estimates from the Transbay Transit Center Vehicle Traffic and Pedestrian Volume Assumptions memorandum (ARUP 2011). These estimates were included in the pedestrian traffic growth assumptions.

The analytic scenarios of Existing plus Project Conditions and a long-term cumulative evaluation are consistent with the approach outlined in the Planning Department's Transportation Impact Analysis Guidelines (City and County of San Francisco 2002) and the State CEQA Guidelines.

Issues Not Addressed Further in this SEIS/EIR

Air Traffic Patterns. The Transbay Program is not within an area covered by an adopted airport land use plan, and this issue was not discussed in the 2004 FEIS/EIR. The environmental setting with respect to air traffic patterns has not changed since the 2004 FEIS/EIR; therefore, this issue is not discussed further in this SEIS/EIR.

[3] San Francisco County Transportation Authority's Travel Demand Model Run "CC2040HF1wLU" for Future 2040 conditions. This model run is consistent with current Association of Bay Area Governments forecasts, and includes all planned and approved projects in the greater downtown area, such as the Transit Center District Plan, Central SoMa Plan, Pier 30/32, and Pier 70.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project as described in this SEIS/EIR would not be implemented, transportation effects will be the same as those presented in Section 5.19 Transit, Traffic, and Parking (pages 5-127 to 5-158) of the 2004 FEIS/EIR and the subsequent addenda, and the 2010 Transbay Program Final EIS Reevaluation. The transportation analysis in the 2004 FEIS/EIR assumed the existing conditions to be year 2020 baseline. The existing plus project was analyzed as 2020 Baseline plus the Transbay Program (2020 Baseline Plus Project), and 2020 cumulative included all of the related city and redevelopment projects. A summary of those previously analyzed effects, as well as previously adopted mitigation measures (Mitigation Measures Ped 1 through Ped 7, PC 1 through PC 7, and GC 1 through GC 5), is provided below. The full description of the mitigation measures is contained in Appendix C of this SEIS/EIR.

Intersection Impacts. The evaluation of intersection operations concluded that significant and unavoidable cumulative impacts on intersection operating conditions will occur. Overall, the Transbay Program was determined to have a significant cumulative traffic impact at seven of the 27 study intersections:

1. First Street/Market Street
2. First Street/Mission Street
3. First Street/Howard Street
4. Fremont Street/Howard Street
5. Beale Street/Howard Street
6. Second Street/Folsom Street
7. Second Street/Bryant Street

For the 2010 Reevaluation by the Federal Railroad Administration (FRA 2010), which focused on the train box and HSR service, baseline transportation network and operations were updated using the City's then-current traffic model, and HSR ridership was added to the transportation analysis from the 2004 FEIS/EIR. The future cumulative horizon year also was extended from 2020 in the 2004 FEIS/EIR to 2030. It was determined that no changes will occur to the significance level of transit operations and patronage impacts; no additional intersections where cumulatively considerable contributions to future intersection operations will occur; no change will occur to the significance level of parking impacts; and no change will occur to the significance level for non-motorized impacts. With respect to traffic conditions, the 2030 cumulative condition shows that 25 of the previously studied 27 intersections will operate at unacceptable levels, resulting in part from the addition of development anticipated by the Transit Center District Plan:

1. First Street/Market Street
2. Fremont Street/Market Street
3. First Street/Mission Street
4. Fremont Street/Mission Street
5. Beale Street/Mission Street
6. Main Street/Mission Street
7. Second Street/Howard Street
8. First Street/Howard Street
9. Fremont Street/Howard Street
10. Beale Street/Howard Street
11. Main Street/Howard Street
12. Second Street/Folsom Street

13. First Street/Folsom Street
14. Fremont Street/Folsom Street/Interstate 80 westbound off-ramp
15. Beale Street/Folsom Street
16. Main Street/Folsom Street
17. Spear Street/Folsom Street
18. Embarcadero Street/Folsom Street
19. Second Street/Harrison Street
20. Essex Street/Harrison Street
21. First Street/Harrison Street/Interstate 80 eastbound on-ramp
22. Fremont Street/Harrison Street
23. Main Street/Harrison Street
24. Spear Street/Harrison Street
25. Second Street/Bryant Street

The mitigation measures from the 2004 FEIS/EIR that were adopted and incorporated into the approved Transbay Program to reduce the effects of these significant cumulative intersection impacts require the Transbay Program to contribute to the City's SFgo Transportation Management System, which is a Citywide program to monitor and manage traffic circulation. The 2004 FEIS/EIR concluded that the Transbay Program will have an adverse effect/significant and unavoidable impact on seven intersections with implementation of mitigation measures.

Pedestrian Impacts. Five study area intersections (each with four crosswalks and four corners) were evaluated for pedestrian LOS:

1. Mission Street/First Street
2. Mission Street/Fremont Street
3. Howard Street/First Street
4. Howard Street/ Fremont Street
5. Folsom Street/Beale Street

Under the No Action Alternative, 11 corners (out of 20 study corners) and two crosswalks (out of 20 study crosswalks) fall to pedestrian LOS F. Isolating the Project Only impacts from the 2020 Baseline plus Project condition indicates that the approved Transbay Program itself will not cause the LOS F condition. The lowest pedestrian levels of service associated with the approved Transbay Program will occur at the intersection of First Street and Mission Street, where the LOS at two corners will fall to LOS E, and at the intersection of Howard Street and Fremont Street, where the LOS at one corner will fall to LOS E. To mitigate the Transbay Program's impact, the following mitigation measures were adopted and incorporated into the approved Transbay Program:

- **Ped 1** – use future construction or redevelopment as opportunities to increase building set-backs, thereby increasing sidewalk widths.

- **Ped 2** – eliminate or reduce sidewalk street furniture in the immediate Transbay Terminal area on corners.

- **Ped 3** – re-time traffic light signalization to pedestrian levels of service at each of the intersections studies that fall into LOS F.

- **Ped 4** – provide crosswalk signalization at intersections where they do not exist already.

- **Ped 5** – provide crosswalk count-down signals at intersections and crosswalks immediately surrounding the new Transbay Terminal.

- **Ped 6** – ensure that Transbay Terminal design increases corner and sidewalk widths at the four intersections immediately surrounding the Transbay Terminal.

- **Ped 7** – provide lights within crosswalks to warn when pedestrians are present in the crosswalk.

The 2004 FEIS/EIR concluded that the Transbay Program will have no adverse effect/less-than-significant impact on pedestrian circulation with implementation of mitigation measures.

Construction Impacts. Without mitigation, construction for the Transbay Program will result in substantial adverse impacts on transit operations, vehicular traffic, local business access, parking, and pedestrian and bicycle circulation, as summarized below.

- Transit operations will experience delays; street-by-street closures will cause rerouting of Muni, Golden Gate Transit, and SamTrans lines; modifications will occur to existing bus stops; and buses that formerly traveled to and from the Transbay Terminal will be redirected to the Temporary Terminal.

- Vehicular traffic will be disrupted by the number of construction trucks required to haul debris and excavated soils, deliver materials, and transport construction crews, as well as road closures and detours for construction. Based on conservative assumptions, an estimated 31 trucks per hour will use local haul routes. All trucks are expected to travel along Seventh Street, departing or returning to the Caltrain railyard. Truck trips, in combination with street closures and related diverted traffic, were evaluated for their intersection impacts at five intersections. The Third Street/Howard Street intersection was determined to experience unacceptable delays. Other intersections will not be adversely affected because the trucks were assumed to travel throughout the day, and volume of trucks during peak-hour movement will be relatively small.

- Driveway access will be affected for a number of local businesses, including offices, retail uses, and parking garages along Townsend Street, between Third and Fifth Streets, and along Mission Street and The Embarcadero.

- On-street parking will be temporarily removed, primarily along Townsend, Second, and Third Streets.

- Street closures, detours, relocated bus stops, and construction traffic will interfere with pedestrian and bicycle circulation throughout the project area.

Because of the above identified impacts on the transportation network and operations, the 2004 FEIS/EIR identified pre-construction-related mitigation measures and five general construction-related mitigation measures. The measures specific to transportation impacts, which were adopted and incorporated into the approved Transbay Program, are summarized below:

- **PC 2** – interview businesses along the alignment to assist in (a) the identification of possible techniques during construction to maintain critical business activities, (b) analyze alternative access routes for customers and deliveries to businesses, (c) develop traffic control and detour plans, and (d) finalize construction practices.

- **PC 4** – establish community construction information/outreach program to provide on-going dialogue construction impacts and possible mitigation/solutions.

- **PC 5** – establish site and field offices located along the alignment to better understand community/business needs during the construction period; manage construction-related matters pertaining to the public; and notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks).

- **PC 6** – implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction, and to provide information on the project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information.

- **PC 7** – develop traffic management plans to maintain access to all businesses. Perform daily cleaning of work areas for the duration of the construction period. Include provisions in construction contracts to require maintenance of driveway access to businesses to the extent feasible.

- **GC 1** – disseminate information to the community in a timely manner regarding anticipated construction activities.

- **GC 2** – provide signage and work with establishments affected by construction activities to develop appropriate signage for alternate routes.

- **GC 3** – install level decking at the cut-and-cover sections to be flush with the existing street or sidewalk levels.

- **GC 4** – provide for efficient sidewalk design and maintenance. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), restore it to its original width during the majority of construction period.

The 2004 FEIS/EIR concluded that construction of the Transbay Program will have no adverse effect/ less-than-significant impact on the transportation network and facilities with implementation of mitigation measures.

Proposed Project

The proposed project components consist of Phase 2 refinements and other transportation improvements and land development at or adjacent to elements of the previously approved Phase 2 of the Transbay Program, which was analyzed in the 2004 FEIS/EIR and addressed transportation impacts. Therefore, the previous analysis covers the same study area directly relevant to the proposed project. Current information, including updated traffic counts, was gathered for the technical analyses. Mitigation Measures Ped 1 through Ped 7; PC 2, 4, 5, 6, and 7; and GC 1, 2, 3, and 4, which were previously identified in the 2004 FEIS/EIR and were adopted and incorporated into the approved Transbay Program, would apply and would continue to be implemented as part of the proposed project. The full text of these measures is reproduced in Appendix C.

Impact TR-1: The proposed project would not result in levels of service that would exceed the City's threshold for acceptable operations or result in localized circulation and access effects. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The proposed project components consist of multiple modifications and additions to the previously approved Transbay Program Phase 2. Many of the proposed project components would not result in any change to travel demand, modifications to roadway or intersection configurations, or substantial changes

to intersection levels of service. These facilities/improvements are the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, and rock dowels. These components represent structural modifications to the proposed DTX facilities that do not involve new travel demand or trip generation, or changes in how the surrounding transportation facilities would function. Consequently, there is no need to discuss these proposed project components further in this impact analysis of traffic operations.

The remaining proposed project components, however, could affect the transportation system as it relates to traffic operations, as discussed below. These components are adjacent land development at the vent structure sites, the additional trackwork south of the Caltrain railyard, the intercity bus facility and adjacent land development, the taxi staging area, the bicycle/controlled vehicle ramp, the AC Transit bus storage facility parking, and the underground pedestrian connector.

701 Third Street Vent Structure and Adjacent Land Development. This proposed project component would displace an existing 1,714-square-foot fast food restaurant and also allow for the development of a new mixed-use building around the vent structure. The replacement of the fast food restaurant by the proposed vent structure would result in a net reduction in the number of trips associated with the site, and thus the direct effect to the existing levels of service at the nearby intersections would not be adverse under NEPA.

To take into account the effects of the future development that could occur adjacent to the vent structure, it was assumed that the potential mixed-use development would include approximately 76,000 square feet consisting of a 4,000-square-foot ground-floor restaurant space and 72,000 square feet of office space.[4] Alternatively, 72 residential units could also be accommodated within the same square footage, but for purposes of this analysis as shown in Table 3.2-6, the travel demand calculations assumed a conservative approach, with the highest vehicle-trip rates represented by office space.

Travel demand estimates for the potential mixed-use development, as well as the existing fast food restaurant on-site that would be displaced, are shown in Table 3.2-6. As shown, the trips generated by the potential mixed-use development would be less than the trips generated by the existing fast food restaurant during the weekday AM and PM peak hours. This reduction in overall vehicle trip generation would not result in an adverse indirect effect under NEPA or a potentially significant impact under CEQA on existing traffic conditions in the surrounding area or on nearby highways and freeway ramps.

It is expected that the vent structure and the potential mixed-use development would be designed to allow for safe ingress and egress. The potential for design elements of any future mixed-use development to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Alternate Vent Structure Location at 699 Third Street and 180 Townsend Street and Adjacent Land Development. As an alternative to the vent structure location discussed above, this proposed project component would displace the existing 41,125-square-foot office building (with ground floor retail space) at 180 Townsend Street, and the existing 6,250-square-foot retail space at 699 Third Street, with the development of approximately 72,000 square feet of light industrial space/small professional offices. The replacement of these retail and office uses by the proposed vent structure would result in a net reduction in the number of trips associated with the site, and the direct effect to the existing levels of service at the nearby intersections would not be adverse under NEPA.

[4] Based on estimates of travel demand totals, this land use would represent the highest vehicle-trip rates for currently permitted uses on the site.

Table 3.2-6
701 Third Street Vent Structure and Adjacent Land Development Travel Demand Calculation

Land Use Trip Direction	Weekday AM Peak Hour						Weekday PM Peak Hour					
	Person Trips					Veh.	Person Trips					Veh.
	Auto.	Tran.	Walk	Bike/Other	Total		Auto.	Tran.	Walk	Bike/Other	Total	
Existing (1,714 square feet)												
Fast Food Restaurant												
In	(86)	(76)	(92)	(13)	(267)	(76)	(41)	(33)	(51)	(7)	(132)	(36)
Out	(80)	(62)	(90)	(12)	(244)	(70)	(44)	(41)	(52)	(7)	(144)	(39)
Total	(166)	(138)	(182)	(25)	(511)	(146)	(85)	(74)	(103)	(14)	(276)	(75)
New (76,000 square feet)												
Ground Floor Restaurant and Office												
In	50	75	22	5	152	42	16	15	19	3	53	14
Out	17	15	19	3	54	15	47	71	22	5	145	40
Total	67	90	41	8	206	57	63	86	41	8	198	54
Net New Trips												
In	(36)	(1)	(70)	(8)	(115)	(34)	(25)	(18)	(32)	(4)	(79)	(22)
Out	(63)	(47)	(71)	(9)	(190)	(55)	3	30	(30)	(2)	1	1
Total	**(99)**	**(48)**	**(141)**	**(17)**	**(305)**	**(89)**	**(22)**	**12**	**(62)**	**(6)**	**(78)**	**(21)**

Notes:
Auto. = automobile trips; Tran. = transit trips; Veh. = vehicle trips
Numbers within parentheses signify a reduction in trips.
Source: Compiled by AECOM in 2014

To take into account the travel demand associated with the potential development that could occur adjacent to the vent structure, relative to the existing uses on-site that would be displaced, Table 3.2-7 shows the net effect in travel demand. As shown, the potential development would generate the same number of vehicle trips during the weekday AM peak hour, and fewer trips than the existing uses during the weekday PM peak hour. As a result, the indirect NEPA effect and the CEQA impact on existing traffic conditions in the surrounding area and on nearby highways and freeway ramps would be not adverse/less than significant.

It is expected that the vent structure and the potential development would be designed to allow for safe ingress and egress. The potential for design elements of any future mixed use development to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Additional Trackwork South of the Caltrain Railyard. This proposed project component would provide a turnback track east of the mainline tracks that would join the mainline tracks at Hubbell Street on the north and extend southward past the at-grade crossing at 16th Street for approximately 1,400 feet, within the Caltrain right-of-way, underneath the elevated I-280 freeway structure. The addition of the proposed turnback track would result in changes to the at-grade crossing at 16th Street. In particular, it would increase the width of the at-grade crossing along 16th Street towards Owens Street but would be accommodated entirely within the Caltrain right-of-way. As part of this proposed project component, existing traffic control equipment and roadway improvements (e.g., crossing gates and channelizing islands) would be modified as necessary.

The changes to this at-grade crossing could result in the following effects:

- Reduction in the length of the storage lanes at the westbound approach on 16th Street because of the increased width of the at-grade crossing by up to 50 feet, depending on the final design and location of the crossing gates;

- Potential queueing at the service entry of the 1700 Owens Street building and the parking garage behind 1650 Owens Street on the UCSF Campus; and

- Increase in the east/west crossing time for vehicles, pedestrians, and bicyclists by up to 15 seconds.

In addition, potential delays in traffic operations are anticipated because of train movements along the turnback track, which would create additional delays beyond those identified in the PCEP EIR due to Caltrain service. Although operating plans for Caltrain service have not been finalized, the number of train crossings of 16th Street along the turnback track could be between 10 and 40 according to Caltrain staff, with few expected during the weekday AM peak period (7:00 a.m. to 9:00 a.m.) or PM peak period (4:00 p.m. to 6:00 p.m.). However, using a conservative scenario, this analysis assumes that two trains would traverse the length of the turnback track and the at-grade crossing at 16th Street during the peak periods (one during the weekday AM peak period and one during the weekday PM peak period).

Train movements along the turnback tracks between the Caltrain railyard and the Transit Center would require the crossing gate at 16th Street to be lowered for approximately 70 seconds, to move the train to the end of the turnback track, and another 70 seconds to move the train back. Accordingly, with the proposed project, each train crossing through the at-grade crossing at 16th Street would be expected to increase the total delay at the intersection by up to 70 seconds (i.e., 60 seconds to cross and an additional 10 seconds to raise and lower the crossing gates) for the eastbound and westbound approaches, as well as the southbound left-turn and northbound right turn movements for vehicular traffic, buses, bicyclists, and

Table 3.2-7
Alternate Vent Structure Site at 699 Third Street and 180 Townsend Street and Adjacent Land Development Travel Demand Calculation

Land Use Trip Direction	Weekday AM Peak Hour						Weekday PM Peak Hour					
	Person Trips					Veh.	Person Trips					Veh.
	Auto.	Tran.	Walk	Bike/Other	Total		Auto.	Tran.	Walk	Bike/Other	Total	
Existing (1,714 square feet)												
Ground Floor Retail (180 Townsend)												
In	(7)	(6)	(8)	(1)	(22)	(6)	(23)	(19)	(29)	(4)	(75)	(20)
Out	(7)	(5)	(7)	(1)	(20)	(6)	(25)	(23)	(30)	(4)	(82)	(22)
Total	(14)	(11)	(15)	(2)	(42)	(12)	(48)	(42)	(59)	(8)	(157)	(42)
Office Space (180 Townsend)												
In	(13)	(23)	(2)	(1)	(39)	(11)	(1)	(1)	(1)	(0)	(3)	(1)
Out	(1)	(1)	(1)	(0)	(3)	(1)	(12)	(22)	(2)	(1)	(37)	(10)
Total	(14)	(24)	(3)	(1)	(42)	(12)	(13)	(23)	(3)	(1)	(40)	(11)
Retail Space (699 Third Street)												
In	(3)	(3)	(3)	(1)	(10)	(3)	(11)	(9)	(13)	(2)	(34)	(9)
Out	(3)	(2)	(4)	(0)	(9)	(3)	(12)	(11)	(14)	(2)	(37)	(10)
Total	(6)	(5)	(7)	(1)	(19)	(6)	(23)	(20)	(27)	(4)	(71)	(19)
New (72,000 square feet)												
Office/Light Industrial Space[1]												
In	33	61	4	3	101	28	2	4	2	1	8	2
Out	3	4	2	1	9	2	32	57	5	3	98	27
Total	36	65	6	4	110	30	34	61	7	4	106	29
Net New Trips												
In	10	29	(9)	(0)	30	8	(33)	(25)	(41)	(5)	(104)	(28)
Out	(8)	(4)	(10)	(0)	(23)	(8)	(17)	1	(41)	(4)	(58)	(15)
Total	**2**	**25**	**(19)**	**(0)**	**(7)**	**0**	**(50)**	**(24)**	**(82)**	**(9)**	**(162)**	**(43)**

Notes:
Auto. = automobile trips; Tran. = transit trips; Veh. = vehicle trips
Numbers within parentheses signify a reduction in trips.
[1] Office land use is used, as light industrial trip generation rates are unavailable. Office land uses typically generate a higher number of trips than industrial uses, but include similar trip distribution characteristics.
Source: Compiled by AECOM in 2014

pedestrians. Therefore, the train crossings of 16th Street along the turnback track would further deteriorate the LOS and would increase the average delay at the intersection of 16th and Seventh Street, during both weekday peak hours.

The 2004 FEIS/EIR assumed that up to 34 two-way train trips would terminate in San Francisco during the weekday AM peak period (6:00 a.m. to 9:00 a.m.), which translates to an average of eight or nine train trips per hour during the weekday AM and weekday PM peak periods. The 2004 FEIS/EIR did not analyze traffic operations at this at-grade crossing; however, this intersection was evaluated in the PCEP EIR (Peninsula Corridor Joint Powers Board 2015), and information from that document was incorporated by reference for this analysis. The PCEP EIR assumed an average of six two-way trips during both the weekday AM and PM peak hours, fewer than assumed in the 2004 FEIS/EIR.

According to the PCEP EIR, the at-grade crossing at 16th Street in 2013 was reported to operate at LOS E with an average delay of 67.3 seconds during the weekday AM peak hour, and at LOS D with an average delay of 49.5 seconds during the weekday PM peak hour. With implementation of the PCEP in the 2020 horizon year, the intersection service levels would be reduced to LOS F with an average delay of over 120 seconds during the weekday AM peak hour and to LOS E with an average delay of 64.5 seconds during weekday the PM peak hour. The change to the AM peak hour LOS was identified as a significant impact in the PCEP EIR.

To mitigate the intersection operation impacts of the PCEP, the PCEP EIR included the following four mitigation measures for the intersection of 16th Street and Seventh Street:

- Widen the northbound approach to lengthen the left-turn pocket;
- Remove the parking lane to create a third lane for the eastbound approach;
- Revise the signal timing and phasing to better coordinate with 16th Street and Owens Street; and
- Pre-empt, pre-signal, or queue cutters as necessary to manage queues relative to the rail crossing.

Implementation of the above mitigation measures as part of the PCEP would reduce the significant intersection effects from the PCEP to less than significant. The PCEP and these mitigation measures are anticipated to be completed in 2020/2021, before implementation of the proposed project.

The proposed project would further change the at-grade crossing of the Caltrain right-of-way by increasing the width of the crossing and reducing the length of the storage lanes on the westbound approach on 16th Street. The additional delay would be 140 seconds in the weekday AM and PM peak hours, for a total estimated delay of 83.7 seconds, based on calculations in the Caltrain PCEP EIR (Peninsula Corridor Joint Powers Board 2015). These changes could result in deterioration in the operation of the 16th Street/Seventh Street intersection, traffic circulation effects along 16th Street east to Owens Street, and potential additional safety risks for pedestrians crossing the widened street that may not be fully addressed by the four mitigation measures identified in the PCEP EIR. As a result, the proposed project could result in an adverse effect under NEPA and a potentially significant impact under CEQA.

Mitigation Measure. Further traffic analysis would be required as part of the final design to evaluate the signal timing and phasing along 16th Street at Seventh Street and Owens Street. As part of New-MM-TR-1.1, this traffic analysis would be conducted during final project design and the resulting modifications to the signal timing and phasing along 16th Street, if warranted, would reduce impacts to intersection operations and to pedestrian and bicycle circulation by maintaining the City's LOS standards. With implementation of New-MM-TR-1.1, no adverse effect would occur under NEPA, and a less-than-significant impact would occur under CEQA.

New-MM-TR-1.1 Modify Signal Operations at the 16th Street Intersection with the Caltrain tracks and Owens Street. During final design, and after the location of the crossing gates for the turnback track along 16th Street has been determined, the TJPA shall conduct further traffic analysis of the turnback and maintenance of way tracks to evaluate traffic, pedestrian, and bicycle operations along 16th Street at Seventh Street, the Caltrain/turnback tracks, and Owen Street. Changes to the PCEP OCS and specialty trackwork, such as control points, switches, and train signals, will be undertaken by the TJPA to allow Caltrain to continue its operations at the level of service defined in the PCEP EIR. In addition, if the traffic analysis shows that the intersections along 16th Street do not meet the City's service levels for automobile traffic and pedestrian and bicycle circulation, the TJPA will coordinate with the City and will be responsible for implementing changes at these crossings to satisfy the City's LOS signalized intersection standards for impacts caused by turnback track operations for DTX; provide sufficient crossing time for pedestrians and bicyclists; and avoid creation of potentially hazardous conditions for pedestrians and bicyclists.

Intercity Bus Facility and Adjacent Land Development. Buildout of this proposed project component would displace a portion of the existing 201 Mission Street building, including terrace space (which is partially used for office space) and surface parking. In place of these uses, development of the intercity bus facility would result in changes to Greyhound bus and Amtrak bus activity and routing. The intercity bus facility would serve as the San Francisco terminal for Amtrak buses that currently stop at the Ferry Building along The Embarcadero and for Greyhound buses that previously used the Transbay Terminal and are currently using the Temporary Terminal.

For the purposes of this analysis, current Greyhound bus and Amtrak bus schedules were examined for the weekday AM and PM peak hours. It was estimated that a maximum of 10 buses would enter and exit the intercity bus facility during the weekday AM and PM peak hours.[5] This level of bus activity would represent a negligible change to traffic operations in the surrounding area, and would not result in an adverse NEPA effect or a potentially significant CEQA impact at the adjacent intersections under Existing Conditions. Furthermore, the City block now proposed for the intercity bus facility was previously evaluated and approved for 848,435 square feet of office and retail space as part of the Transbay Program. The portion of the block south of the proposed intercity bus facility is anticipated to accommodate approximately 750,000 square feet of office and retail space. As a result, the approved Transbay Program and the 2004 FEIS/EIR could allow an additional 98,435 square feet of development with travel demands substantially greater than those for the intercity bus facility. The traffic impacts of this proposed project component would be less than assumed for the approved Transbay Program.

Travel demand estimates for the potential residential or office use that could be developed above the intercity bus facility are shown in Table 3.2-8. The development schemes assume a new 128-unit residential building (anticipated to be single-room occupancy), or a 45,000-square-foot office building, as described in Chapter 2, Project Alternatives.[6] Trips generated by the potential residential or office use would be less than the trips generated by the existing surface parking lot, resulting in a decrease in vehicle trips during the weekday AM and PM peak hours compared to Existing Conditions. Because of this reduction in overall vehicle trip generation, the proposed intercity bus facility plus adjacent land

[5] No planned changes to Amtrak bus or Greyhound bus services have been identified by either transit service provider related to the future use of the intercity bus facility.

[6] Based on estimates of travel demand totals, the 45,000-square-foot office land use program would represent the highest vehicle-trip rates for currently permitted uses on the site.

Table 3.2-8
Intercity Bus Facility and Adjacent Land Development Travel Demand Calculation

Land Use Trip Direction	Weekday AM Peak Hour						Weekday PM Peak Hour					
	Person Trips					Veh.	Person Trips					Veh.
	Auto.	Tran.	Walk	Bike/other	Total		Auto.	Tran.	Walk	Bike/other	Total	
Existing												
Office												
In	(5)	(9)	(1)	(0)	(15)	(4)	(0)	(1)	(0)	(0)	(1)	(0)
Out	(0)	(1)	(0)	(0)	(1)	(0)	(5)	(8)	(1)	(0)	(14)	(4)
Total	(5)	(10)	(1)	(0)	(16)	(4)	(5)	(9)	(1)	(0)	(15)	(4)
Parking Lot												
In	--	--	--	--	--	(24)	--	--	--	--	--	--
Out	--	--	--	--	--	--	--	--	--	--	--	(24)
Total	--	--	--	--	--	(24)	--	--	--	--	--	(24)
New (128 dwelling units)												
Single-Room Occupancy (Residential)												
In	--	--	--	--	--	--	14	52	25	10	100	11
Out	23	78	35	16	152	18	5	26	13	5	50	5
Total	23	78	35	16	152	18	19	78	38	15	150	16
Net New Vehicle Trips												
In	--	--	--	--	--	(28)	--	--	--	--	--	11
Out	--	--	--	--	--	18	--	--	--	--	--	(23)
Total	--	--	--	--	--	(10)	--	--	--	--	--	(12)
New (45,000 square feet)												
Office												
In	21	38	3	2	63	18	2	2	1	0	5	1
Out	2	2	1	0	5	1	20	36	3	2	61	17
Total	23	40	4	2	69	19	22	38	4	2	66	18
Net New Vehicle Trips												
In	--	--	--	--	--	(10)	--	--	--	--	--	1
Out	--	--	--	--	--	1	--	--	--	--	--	(11)
Total	**--**	**--**	**--**	**--**	**--**	**(9)**	**--**	**--**	**--**	**--**	**--**	**(10)**

Notes:
Auto. = automobile trips; Tran. = transit trips; Veh. = vehicle trips
Numbers within parentheses signify reductions in trips.
Source: Compiled by AECOM in 2014

development would not be expected to result in an adverse indirect effect under NEPA or a potentially significant impact under CEQA on existing traffic conditions within the surrounding area or on nearby highways and freeway ramps.

It is expected that both the intercity bus facility and the potential residential or office development would be designed to allow for safe ingress and egress. The potential for design elements of any future residential or office development to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Taxi Staging Area. Up to 16 spaces along the south side of Minna Street (between First Street and Second Street along the north side of the Transit Center), 10 spaces along the north side of New Natoma Street (between Beale and Howard Streets along the south side of the intercity bus facility), and up to five spaces along Main Street (between New Natoma Street and Howard Street) would be provided for taxi staging. The elimination of on-street parking and loading spaces may be necessary for the provision of these 31 taxi staging spaces. The potential elimination of on-street parking spaces would require motorists to choose to park in other nearby on-street parking spaces or in off-street parking facilities. This may result in minor redistribution of taxis and passenger vehicles along adjacent streets, but would not generate new vehicle trips to the area. Because this difference in vehicular activity would represent a negligible change to traffic operations in the adjacent area, the taxi staging area would be expected to have a minimal effect on intersection operations.

Bicycle/Controlled Vehicle Ramp. The vehicle ramp would be limited to a maximum speed of 15 miles per hour and would include speed control measures. Bicycle storage is intended for all users of the Transit Center, providing storage for up to 1,000 bicycles. The proposed bicycle storage is also expected to be sufficient to accommodate demand from future Caltrain and HSR passengers.

Bicyclists would reach the proposed bicycle ramp from the existing bicycle network. Bicyclists would follow the most convenient routes to reach their destinations, and are expected to use the surrounding bicycle facilities network. In general, increases in bicycle activity levels would have a negligible change to traffic operations in the surrounding area, and could result in minor reductions in vehicular volumes, as people may change their mode of travel to bicycle use. Consequently, this proposed project component would have a minimal effect on intersection operations.

AC Transit Bus Storage Facility Parking. Parking by the general public at the AC Transit bus storage area would only occur after all AC Transit routes have departed the facility. Given that the majority of AC Transit routes run beyond 6 p.m., it is unlikely that public parking at the AC Transit bus storage facility would generate an appreciable amount of vehicle trips during the weekday AM or PM peak periods. This proposed project component would not require design changes to the AC Transit bus storage facility, with the possible exception of minor parking operations equipment; therefore, this proposed project component would not introduce design features that would negatively affect the operations of the surrounding transportation network. Thus, parking at the AC Transit bus storage facility would not result in significant impacts on intersection operations, because activity associated with the bus storage facility would occur outside of peak traffic periods.

BART/Muni Underground Pedestrian Connector. According to estimates prepared by the TJPA in 2012, more than 45,000 pedestrians could travel through this facility each day, including commuters transferring between transit services and people walking between Market Street and south of Mission Street. This forecast anticipates growth in the proposed project area and future ridership on Caltrain and HSR. Based on current daily pedestrian activity patterns and transit use, this daily total would equate to

approximately 7,720 pedestrians during the weekday midday peak hour and 9,500 pedestrians during the weekday PM peak hour.

Because of the proposed underground pedestrian connector's proximity to the Beale Street/Market Street and Beale Street/Mission Street intersections, this proposed project component would reduce overall pedestrian volumes at these locations and reduce average delay for motorists and pedestrians.

Discussions about access and use of the underground pedestrian connector are ongoing between the TJPA and BART. If access were limited to passengers directly transferring between Caltrain or HSR at the Transit Center and BART or Muni at the Embarcadero BART/Muni Metro Station, the volume of pedestrians within the connector would be lower, and, correspondingly, pedestrian volumes along Beale Street would be higher. Nevertheless, this proposed project component would still reduce pedestrian volumes along Beale Street and result in improved conditions.

Impact TR-2: The proposed project would not result in substantial increases to transit demand resulting in unacceptable levels of transit service, or cause a substantial increase in delays or operating costs. (No Adverse Effect/Less-than-Significant Impact)

The proposed project considers multiple modifications and additions to the previously approved Transbay Program. Many of the proposed project components would not result in any change to travel demand or substantial changes to transit operations: the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, rock dowels, and taxi staging area. These proposed project components are structural changes to DTX infrastructure or transportation improvements that have no potential to generate transit demand or substantially alter transit operations. Consequently, there is no need to discuss these proposed project components further in this impact analysis of transit operations.

The remaining proposed project components could potentially affect the transportation system as it relates to transit operations and are discussed below. These components are the adjacent land development at the vent structure sites, the intercity bus facility and adjacent land development, the AC Transit bus storage facility parking, and the underground pedestrian connector.

701 Third Street Vent Structure and Adjacent Land Development. As shown in Table 3.2-6, development of 701 Third Street with a vent structure and potential mixed-use building would result in fewer transit trips during the weekday AM and PM peak hours than the fast food restaurant it would displace. This reduction in overall transit trip generation would, therefore, not increase demand for existing transit operations.

Alternate Vent Structure at 699 Third Street and 180 Townsend and Adjacent Land Development. As shown in Table 3.2-7, development at the alternate vent structure and potential professional office/ light industrial building would result in fewer transit trips during the weekday PM peak hour, and an increase of 25 transit trips during the weekday AM peak hour. This change in ridership during the weekday AM peak hour would not have a substantial impact on existing local or regional transit providers or to transit facilities, because, as described in Section 3.2.2, current transit service in and around the proposed project area has capacity to accommodate additional riders. Therefore, this proposed project component's transit effects would be not adverse/less than significant.

Additional Trackwork South of the Caltrain Railyard. This proposed project component would include installation of a new track segment to allow trains to travel between the Caltrain railyard and the Transit Center. The SFMTA is proposing to re-route the 22 Fillmore electric trolley buses (ETB) from the current route, crossing over the Caltrain right-of-way at 18th Street, to an at-grade crossing at 16th Street. The overhead wire work associated with the proposed 22-Filmore extension and the change to its route is

planned for implementation in about 5 years. As an interim phase, the new Muni 55-16th Street diesel motor coach service began operation through this intersection in January 2015. Installation of the direct current 600-volt overhead catenary system (OCS) for the ETB at 16th Street would conflict with the proposed installation of the 25 kVA alternating current OCS of the proposed project and the PCEP.

TJPA, in cooperation with the Peninsula Corridor Joint Powers Board and SFMTA, would modify, as necessary, the technical solution implemented by Caltrain for the PCEP to allow operation of the ETB at the 16th Street crossing as well as Caltrain along the turnback track. Two feasible options, subject to approval by the California Public Utilities Commission (CPUC), have been identified and are described in the PCEP EIR as Mitigation Measure TRA-CUMUL-2 (Peninsula Corridor Joint Powers Board 2015). Both options would include a short gap in the Caltrain OCS at the 16th Street crossing to allow the ETB OCS to be installed through the intersection. The short section of the ETB OCS would not be energized to avoid any potential for contact between energized parts of the Caltrain OCS and the ETB OCS. When TJPA is ready to construct the turnback track, it will redesign and implement modifications in accordance with the prevailing NFPA standards and the California Code of Regulations for overhead power lines, and in cooperation with the Peninsula Corridor Joint Powers Board, SFMTA, and CPUC. TJPA will pay for the necessary modifications to the lines or the equipment to avoid conflicts between the ETB OCS and the OCS used by Caltrain along the mainline and the turnback track. Therefore, this proposed project component would have no effects/impacts on transit operations and service.

Intercity Bus Facility and Adjacent Land Development. As shown in Table 3.2-8, development of the residential or office uses would result in an increase in transit trips during the weekday AM and PM peak hours compared to Existing Conditions. Because the potential residential land use would generate the majority of its transit trips in the reverse commute direction,[7] the proposed residential development would not be expected to substantially affect ridership levels on transit providers or to substantially affect transit facilities. If the stories above the intercity bus facility are developed for office space instead of residential uses, this proposed project component would add fewer than 30 passengers to all transit providers during each peak hour. This change in ridership would not have a substantial impact on existing local or regional transit providers or to transit facilities, because, as described in Section 3.2.2, current transit service in and around the proposed project area has capacity to accommodate additional riders. Furthermore, as explained in Impact TR-1, the proposed development consisting of 128 dwelling units, or 45,000 square feet of office and retail space, would be less than the amount of development evaluated for this site in the 2004 FEIS/EIR. Therefore, the proposed project's transit effects would be not adverse/less than significant and less than the transit demand considered for the approved Transbay Program.

AC Transit Bus Storage Facility Parking. As explained above under Impact TR-1, the majority of AC Transit routes run beyond 6 p.m., so that parking by the general public at the AC Transit bus storage facility would not generate an appreciable amount of transit demand during the weekday AM or PM peak periods. The availability of additional parking could diminish transit ridership, but this reduction would not be appreciable because the capacity of the bus storage area would be 232 automobile parking spaces, and its use would be during off-peak hours. The Transit Center District Plan is expected to generate a demand for approximately 8,320 parking spaces during the evening peak period (City of San Francisco 2012). The maximum amount of parking that could be provided in the plan area is approximately 3,950 with valet operations; therefore, the Transit Center District Plan area shortfall would be approximately 4,370 spaces (City of San Francisco 2012). Thus, public parking at the AC Transit bus storage area would not result in significant impacts on transit operations, but could assist with the parking shortfall anticipated with future development in the area.

[7] The peak commute direction for transit in San Francisco is toward downtown during the AM peak hour and away from downtown during the PM peak hour.

BART/Muni Underground Pedestrian Connector. As described under Impact TR-1, this facility could accommodate more than 45,000 users a day, including people directly transferring between the transit operations and people using the connector to walk between Market Street and south of Mission Street. This proposed project component would not itself generate additional transit demand, but would serve to enhance connectivity among transit services and operators, and provide a convenient pathway for transit patrons. Therefore, this project component would not be expected to result in potentially adverse/ significant impacts on existing transit operations within the adjacent area.

Impact TR-3: The proposed project would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or interfere with pedestrian accessibility to the site and adjoining areas. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The 2004 FEIS/EIR addressed impacts associated with pedestrian operations and identified Mitigation Measures Ped 1 through Ped 7, which were adopted and incorporated into the Transbay Program to mitigate identified impacts. These mitigation measures would apply to and be implemented as part of the proposed project.

The proposed project considers multiple modifications and additions to the previously approved Transbay Program. As explained previously under Impact TR-1 and Impact TR-2, several proposed project components would not result in any change to travel demand or changes to the transportation facility operations and, thus, would not be expected to affect pedestrian circulation or safety: the widened throat structure, extended train box, the tunnel stub box, rock dowels, taxi staging area, bicycle ramp/controlled vehicle ramp, and AC Transit bus storage facility parking. These uses and activities would not generate pedestrian activity or alter pedestrian movements; therefore, these proposed project components are not discussed further in this impact analysis of pedestrian circulation. By contrast, the remaining proposed project components could affect pedestrian operations and are discussed below. They are the realigned Fourth and Townsend Street Station, adjacent land development at the vent structure sites, the intercity bus facility and adjacent land development, and the underground pedestrian connector.

Realigned Fourth and Townsend Street Station. Development of the vent structure at the east end of the realigned Fourth and Townsend Street Station has been conceptually sited where currently a pedestrian access point exists into the Caltrain Fourth and King Station. In addition, the pedestrian access point for the Fourth and Townsend Street Station likely would be located at the same location. These proposed project features would alter pedestrian access to the existing Fourth and King Station at its northeast entry. Caltrain and TJPA have coordinated on the development of the station plans, and TJPA has committed to reduce construction effects of the proposed project on the existing station and its access and operations. The preliminary cost estimates prepared for the proposed project (TJPA 2010) include up to $25 million to mitigate construction-related impacts of the Fourth and Townsend Station on existing Caltrain support facilities, such as pedestrian access.[8]

701 Third Street Vent Structure and Adjacent Land Development. As shown in Table 3.2-6, development of the 701 Third Street vent structure and potential mixed-use development would replace the existing fast food restaurant use. The pedestrian trips generated by the potential mixed-use development would be less than the trips generated by the existing use, resulting in a reduction of pedestrian trips during the weekday AM and PM peak hours. In addition, development of the proposed project at this site would result in a reduction in transit riders, who may walk between this proposed project component site and nearby transit facilities. It is expected that the vent structure and the potential

[8] See Preliminary Engineering Construction Cost Estimate (TJPA 2010), Vol. 1, page 21, cost item #30 (Support Facilities: Yards, Shops, Administration Buildings) that is intended to address DTX costs that include Caltrain's existing support facilities, such as administration and storage buildings, bike storage, employee parking, and crew facilities.

mixed development would be designed to allow for safe pedestrian ingress and egress and circulation. The potential for design elements of any future mixed use development to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Alternate Vent Structure at 699 Third Street and 180 Townsend Street and Adjacent Land Development. As shown in Table 3.2-7, development of the alternate vent structure site and potential professional office/light industrial development would replace the existing retail and office uses. The pedestrian trips generated by the potential office/light industrial building would be less than the trips generated by the existing use, resulting in a reduction of trips. The alternative vent structure and the potential industrial development would be designed to allow for safe pedestrian ingress and egress, and circulation. The potential for design elements of any future land development component to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Additional Trackwork South of the Caltrain Railyard. The addition of a turnback track would result in a three-track at-grade crossing at 16th Street east of Seventh Street, increasing the distance of this crossing by up to 50 feet. This change at the east/west crossing along 16th Street would increase crossing time for pedestrians by up to 15 seconds.

Mitigation Measure. Changes to the signal timing and other modifications at this intersection for the PCEP, and further design review of this segment along 16th Street by TJPA in collaboration with Peninsula Corridor Joint Powers Board and the City, described earlier as New-MM-TR-1.1, would reduce potential effects on pedestrians by providing sufficient time for pedestrians to completely cross the widened crossing and by avoiding the creation of potentially hazardous conditions for pedestrians.

Intercity Bus Facility and Adjacent Land Development. Pedestrians walking to and from the proposed intercity bus facility would use the pedestrian network and take the most convenient routes to reach their destinations. The intercity bus facility would not, in and of itself, result in an increase in service for Greyhound and Amtrak buses compared to their current service levels; thus, pedestrian activity at the intercity bus facility would not represent new pedestrian activity, and would be expected to be accommodated by the surrounding pedestrian facilities.

As shown in Table 3.2-8, development of the potential residential or office uses that could occur above the proposed intercity bus facility would replace a portion of existing office use at 201 Mission Street. The pedestrian trips generated by the potential residential or office use would result in an increase in pedestrian trips during the weekday AM and PM peak hours compared to Existing Conditions. These additional pedestrians would be distributed throughout the SoMa, which is served by pedestrian facilities that include sidewalks, crosswalks, and pedestrian signals along all streets and intersections. It is expected that these pedestrians would use the most convenient routes to reach their destinations, and would use the surrounding pedestrian facilities network. As previously explained in the discussions of Impact TR-1 and Impact TR-2, the development projected for this proposed project component would be less than that environmentally cleared and approved as part of the Transbay Program. Thus, this proposed project component's pedestrian effects around this site would be both not adverse/less than significant and less than the amount of development analyzed for this site in the 2004 FEIS/EIR.It is expected that both the intercity bus facility and the potential residential or office development would be designed to allow for safe pedestrian ingress and egress and circulation. The potential for design elements of the adjacent land development to affect vehicular, pedestrian, and bicycle circulation would be examined when plans for the improvements are submitted to the City for approval.

BART/Muni Underground Pedestrian Connector. Based on current daily pedestrian activity patterns and transit use, approximately 7,720 pedestrians during the weekday midday peak hour and 9,500 pedestrians during the weekday PM peak hour would use this connector. This level of use would substantially reduce pedestrian volumes at study crosswalks and street corners along Beale Street, and therefore this proposed project component would likely improve the crosswalk level of service and street corner level of service presented in Tables 3.2-4 and 3.2-5.

Impact TR-4: The proposed project would not be expected to substantially interfere with bicycle accessibility to the site and adjoining areas. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The proposed project includes modifications and additions to the previously approved Transbay Program. Many of the proposed project components would not result in any change to travel demand or changes to the transportation facility operations and, thus, would not be expected to affect bicycle operations: the widened throat structure, extended train box, the tunnel stub box, taxi staging area, AC Transit bus storage facility parking, and BART/Muni underground pedestrian connector. These uses and activities would not generate or increase bicycle use and, consequently, are not discussed further in this impact analysis of bicycle circulation.

The remaining proposed project components could, however, affect bicycle safety and circulation and are discussed below. These are the realigned Fourth and Townsend Street Station, adjacent land development at the vent structure sites, additional trackwork south of the Caltrain railyard, the intercity bus facility and adjacent land development, and the bicycle/controlled vehicle ramp. The calculation of the demand of bicycle trips, like that for vehicular and transit trips, is based on the size and type of land uses (e.g., office, commercial, retail) and the projected number of transit riders who would park the bicycle at the Transit Center and then proceed to use transit services on the project site, and is not a function of the number of bicycle parking provided (supply). Although the increased bicycle storage that would be included within the Transit Center may increase the choice of making a bicycle trip for bicyclists, the availability of up to 1,000 bicycle parking spaces is not expected to induce a substantial modal shift.

Realigned Fourth and Townsend Street Station. Development of the vent structure at the east end of the realigned Fourth and Townsend Street Station would require removing existing bicycle parking at the Fourth and King Station. This would reduce bicycle access and parking at the existing Fourth and King Caltrain Station during construction. Caltrain and TJPA have coordinated on the development of the station plans, and TJPA has committed to reduce construction-related effects of the proposed project on the existing station and its access and operations. The preliminary cost estimates prepared for the proposed project (TJPA 2010) includes up to $25 million to mitigate construction-related impacts of the Fourth and Townsend Station on existing Caltrain support facilities, such as bicycle parking and access.

701 Third Street Vent Structure and Adjacent Land Development. Development of the 701 Third Street vent structure and potential mixed-use building would replace the existing fast food restaurant use. The vehicular and bicycle traffic volumes generated by the potential mixed-use building at 701 Third Street would be less than the trips generated by the existing use, resulting in a reduction of trips (see Table 3.2-6). It is anticipated that the potential mixed-used development would provide the bicycle parking and shower/locker facilities required by the San Francisco Planning Code. The potential for design elements of any future mixed-use development to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Alternate Vent Structure at 699 Third Street and 180 Townsend Street and Adjacent Land Development. Development of the alternate vent structure site and potential professional office/light

industrial building would replace the existing retail and office uses. The vehicular and bicycle traffic volumes generated by the potential office/light industrial building would be less than the trips generated by the existing use, resulting in a reduction of trips (see Table 3.2-7). It is anticipated that the new development would provide the bicycle parking and shower/locker facilities required by the San Francisco Planning Code. The potential for design elements of any future mixed-use development to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Additional Trackwork South of the Caltrain Railyard. The addition of the turnback track would result in a three-track at-grade crossing at 16th Street east of Seventh Street, increasing the distance of this crossing by up to 50 feet. This change at the east/west crossing along 16th Street would increase crossing time for bicyclists by up to 10 seconds.

Mitigation Measure. Changes to the signal timing and other modifications at this intersection for the PCEP, and further design review of this segment along 16th Street by TJPA in collaboration with Peninsula Corridor Joint Powers Board and the City, described earlier as New-MM-TR-1.1, would reduce potential effects on bicyclists by providing sufficient time for bicyclists to completely cross the widened crossing and by avoiding the creation of potentially hazardous conditions for bicyclists.

Intercity Bus Facility and Adjacent Land Development. As shown in Table 3.2-8, development of the potential residential or office uses would replace the existing office use. The bicycle trip volume generated by the potential residential or office use would result in a minor increase in bicycle activity during the weekday AM and PM peak hours, compared to Existing Conditions. This level of increase in bicycle trips would not be expected to substantially affect bicycle operations in the proposed project area, because of the availability of on-street bicycle lanes and routes. In addition, future development would need to comply with the San Francisco Planning Code requirements for bicycle parking and shower/ locker facilities. The potential for design elements of any future residential or office use to affect vehicular, pedestrian, and bicycle circulation would be examined by the City in a separate CEQA environmental review process, based on a future site-specific design.

Bicycle/Controlled Vehicle Ramp. This proposed project component is the installation of a bicycle ramp and below-grade bicycle facilities along the north side of Howard Street, between First Street and Second Street. The vehicle ramp would be limited to a maximum speed of 15 miles per hour and would include speed control measures. Bicycle storage is intended for all users of the Transit Center, providing storage for up to 1,000 bicycles. The proposed bicycle storage is expected to be sufficient to accommodate demand from future Caltrain and HSR passengers. Accordingly, this proposed project component would have a beneficial effect in terms of supporting the bicycle community and enriching connections to other transit services.

Bicyclists would be expected to reach the proposed bicycle ramp and below-grade facilities from the existing bicycle network surrounding the proposed project area. Users of the proposed bicycle ramp and below-grade bicycle facilities would take the most convenient routes to reach their destination, and would be expected to be accommodated by the surrounding bicycle facilities; therefore, this proposed project component would have a minimal effect on bicycle operations.

Impact TR-5: The proposed project would not result in a parking or loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site facilities or within convenient designated on-street areas. (No Adverse Effect for Parking and No Adverse Effect/Less-than-Significant Impact for Loading)

SB 743 amended CEQA in 2013 by adding Public Resources Code Section 21099 regarding the analysis of parking impacts for certain urban infill projects in transit priority areas.[9] Public Resources Code Section 21099(d) 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." Thus, the analysis for this SEIR/EIR did not consider adequacy of parking in determining the significance of project impacts under CEQA as it relates to the adjacent land development. However, TJPA acknowledges that parking conditions may be of interest to the public and the decision makers, and is still relevant under NEPA. Therefore, parking conditions are presented in this analysis to evaluate effects and compare them to those identified in the 2004 FEIS/EIR. The analysis of loading spaces is presented to address City guidelines regarding the availability of sufficient loading areas.

The proposed project involves modifications and additions to the previously approved Transbay Program. Several of the proposed project components would not result in substantial changes to parking or loading conditions: the widened throat structure, extended train box, tunnel box stub, rock dowels, additional trackwork south of the Caltrain railyard, bicycle/controlled vehicle ramp, and BART/Muni underground pedestrian connector. These proposed project components would not involve uses or activities that generate a demand for parking or loading space and, consequently, are not evaluated further in this impact analysis of parking and loading spaces. The remaining proposed project components could affect parking and loading conditions and are discussed below: the realigned Fourth and Townsend Street Station, adjacent land development around the vent structures, the intercity bus facility and adjacent land development, the taxi staging area and the AC Transit bus storage facility parking. From a CEQA perspective, parking conditions associated with the adjacent land development are discussed for informational purposes.

Realigned Fourth and Townsend Street Station. Development of the vent structure at the west end of the realigned Fourth and Townsend Street Station would require removal of existing Caltrain employee parking. This would reduce the availability of parking for Caltrain employees as well as employee facilities at the Fourth and King Street Station. Caltrain and TJPA have coordinated on the development of the station plans, and TJPA has committed to reduce construction-related effects of the proposed project on the existing station and its access and operations. The preliminary cost estimates prepared for the proposed project (TJPA 2010) include up to $25 million to mitigate construction-related impacts of the Fourth and Townsend Station on existing Caltrain support facilities, such as Caltrain employee parking.

701 Third Street Vent Structure and Adjacent Land Development. Given the overall reduction in activity levels associated with the 701 Third Street vent structure and potential mixed-use building which would replace the existing fast food restaurant (see Table 3.2-6), it is expected that the overall demand for parking and loading spaces would be reduced. In addition, the potential development must meet the San Francisco Planning Code off-street loading space requirements (i.e., adhering to size and access standards), and would be consistent with the allowable off-street parking space limits. Consequently, this proposed project component would not result in an adverse effect/potentially significant impact on parking or loading conditions within the adjacent area.

Alternate Vent Structure at 699 Third Street and 180 Townsend and Adjacent Land Development. Given the overall reduction in activity levels associated with the alternate vent structure site and potential

[9] A "transit priority area" is defined as an area within ½ mile of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resources 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 interval 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: sfmea.sfplanning.org/Map%20of%20San%20Francisco%20Transit% 20Priority%20Areas.pdf.

professional office/light industrial building that would replace the existing land uses (see Table 3.2-7), it is expected that the overall demand for parking and loading spaces would be reduced. In addition, the potential development must meet the San Francisco Planning Code off-street loading space requirements (i.e., adhering to size and access standards), and would be consistent with the allowable off-street parking space limits. Therefore, this proposed project component would not result in an adverse effect/potentially significant impact on parking or loading conditions within the adjacent area.

Intercity Bus Facility and Adjacent Land Development. The potential residential or office development above the proposed intercity bus facility would be required to provide off-street loading spaces (i.e., adhering to the San Francisco Planning Code size and access requirements), and would be consistent with the allowable off-street parking space limits. However, this proposed project component may generate parking and loading demand that could not be accommodated on-site. This shortfall may result in a minor increase in the demand for on-street parking and loading spaces in the immediate vicinity. Because shortfalls in parking supply compared to demand are not considered to be significant environmental impacts in San Francisco, and on-street loading spaces are generally available to serve unmet loading demand, project buildout at this site would not result in an adverse effect/potentially significant impact on parking or loading conditions within the adjacent area.

Taxi Staging Area. This proposed project component is development of taxi staging along Minna, New Natoma, and Main Streets in proximity to main ingress/egress points of the Transit Center. The elimination of on-street parking and loading spaces may be necessary to provide the proposed 31 taxi staging spaces. The potential elimination of on-street parking spaces would require motorists to choose to park in other nearby on-street parking spaces or in off-street parking facilities. This may result in minor redistribution of taxis and passenger vehicles along the adjacent streets. This shortfall may result in a minor increase in the demand for on-street parking and loading spaces in the immediate vicinity. Because shortfalls in parking supply compared to demand are not considered to be significant environmental impacts in San Francisco, and on-street loading spaces are generally available to serve unmet loading demand, the proposed taxi staging area would not result in an adverse effect/potentially significant impact on parking or loading conditions within the adjacent area.

AC Transit Bus Storage Facility Parking. This proposed project component would allow the use of the AC Transit bus storage facility for public nighttime and event parking when it is not needed for bus storage. The proposed nighttime public parking at this site would help accommodate evening parking demand, and improve overall parking conditions in the area. Therefore, this proposed project component would not increase parking demand, but would have the beneficial effect of creating more parking opportunities where an areawide shortfall has been forecast.

Impact TR-6: The proposed project would not result in inadequate emergency access. (No Adverse Effect/Less-than-Significant Impact)

The existing roadways surrounding all proposed project components would continue to enable emergency vehicle response to all areas. In addition, police, fire, and emergency services vehicles often identify and use multiple routes, depending on the time of day, traffic conditions, and other roadways nearby. Peak period traffic congestion generally does not result in delay for emergency vehicles, which have the right-of-way and often use multi-lane major arterials for access.

Impact TR-1 concludes that none of the proposed project components would result in deterioration of intersection operations. Therefore, the proposed project would not impede emergency responders traveling on project area streets. Project components would be designed for safe ingress and egress, as well as for internal circulation for all users. The potential for design elements to affect emergency access would be examined as individual project components are developed.

Impact C-TR-7: The proposed project would result in temporary impacts on the surrounding transportation network as a result of construction activity, but these impacts would be reduced by previously approved measures incorporated into the project, City requirements, and the DTX Design Criteria, which call for preparation of a plan for maintenance and protection of traffic. (No Adverse Effect/Less-than-Significant Impact)

Construction Impact Overview. The proposed project consists of refinements to the approved Transbay Program to accommodate future Caltrain and HSR service, as well as transportation improvements to promote local and regional transit connectivity. New proposed project components that were not identified in the 2004 FEIS/EIR that involve considerable excavation, hauling, and materials delivery include the extended train box and the tunnel stub box, which would result in additional construction-period transportation disruption. Because of the extent of excavation associated with both of these proposed project components, the number of truck trips and the duration of construction activities would be substantial compared to the other refinements and improvements.

By contrast, the throat structure, vent structures, and underground Fourth and Townsend Street Station were all addressed in the 2004 FEIS/EIR, but the proposed project updates the designs or locations for these facilities. In particular, the widened throat structure involves additional excavation and construction, the vent structures sites have been refined, and the underground Fourth and Townsend Street Station is proposed to be realigned. Therefore, these proposed project components would not substantially alter the construction traffic impacts identified in the 2004 FEIS/EIR, but would result in greater disturbance around the widened throat structure, more site-specific impacts for the vent structures along the mined tunnel segment, and additional street closures along Townsend Street for the realigned underground station.

The rock dowels were not included in the 2004 FEIS/EIR, but their inclusion in the proposed project would have minimal construction-period effects. The rock dowels would be installed during construction of the mined tunnel segment and, thus, would occur within the timeframe already evaluated for traffic disruption of this construction activity. Construction staging would be expected to occur at the portals and at the vent structure sites at Third and Townsend Streets and at Second and Harrison Streets, where construction staging and construction crew and materials would already be accessing the tunnel segments. As a result, an incremental increase of material deliveries to these locations would result.

Other improvements, such as the additional trackwork south of the Caltrain railyard, the taxi staging area, bicycle/controlled vehicle ramp, and AC Transit bus storage facility parking, were not included in the 2004 FEIS/EIR and would involve minimal construction equipment, materials, and crews and for considerably shorter durations than the other project components. The disruption to the transportation system for these proposed project components would be minor compared to the impacts identified for the Transbay Program in the 2004 FEIS/EIR.

Construction of the proposed project components described in Section 2.2.2, Proposed Project under "Construction Scenario and Activities," assumes a schedule and sequencing that considers the greatest potential overlap of the proposed project components. This approach yields a conservative analysis of the potential construction impacts in terms of traffic disturbance, air and greenhouse gas emissions, and noise. The mitigation measures that were identified in the 2004 FEIS/EIS would be implemented during Phase 2 construction, including Mitigation Measures PC 2, PC 4 though PC 7, and GC 1 through GC 4 that specifically relate to pre-construction and general construction measures.

The proposed project components primarily involve refinements to the approved Transbay Program. As a result, the construction activities, intensity, and duration for the proposed project components are considerably less than identified for the approved Transbay Program, which included the demolition of

the Transbay Terminal and bus ramps, the construction of the train box and the new Transit Center, and the tunnel for Caltrain and HSR service. None of the proposed project components, except perhaps the tunnel stub box, approaches the level and intensity of construction activities evaluated and mitigated in the 2004 FEIS/EIR. Therefore, transportation-related constructed effects of the proposed project would be less adverse than those reported in the 2004 FEIS/EIR.

Construction Traffic Management. In compliance with the San Francisco Noise Ordinance and permit conditions, it is expected that construction would occur primarily on weekdays from 7 a.m. to 5 p.m., with work occurring on Saturday from 8 a.m. to 4 p.m. on an as-needed basis only. Contractors would follow Regulations for Working in San Francisco Streets ("The Blue Book"), and would provide reimbursement to the San Francisco Municipal Transportation Agency for installation and removal of temporary striping and signage required during construction. In addition, all construction activities would be conducted consistent with previously adopted Mitigation Measure PC 7 from the 2004 FEIS/EIR, requiring development of traffic management plans, and the DTX Design Criteria and construction management plan. The DTX Design Criteria, developed by the TJPA for use in the design and construction of DTX-related facilities, includes a section specifically devoted to the maintenance and protection of traffic (TJPA, PMPC 2009). A maintenance and protection of traffic plan would be prepared by the contractor in accordance with the American Association of State Highway and Transportation Officials Policy on Geometric Design of Highways and Streets, the Caltrans Manual of Uniform Control Devices, and City Department of Public Works and Department of Parking and Traffic regulations. The traffic plan would set forth the guidelines and standards for road closures, pedestrian and bicyclist detours, access to businesses and residences and for emergency response vehicles, temporary traffic controls, and signage.

Any travel lane or sidewalk closures determined to be necessary for construction would be coordinated with the City to minimize the impacts on local traffic, but would likely result in temporary impacts on traffic and pedestrian circulation. In general, lane and sidewalk closures are subject to review and approval by the Department of Public Works and the Interdepartmental Staff Committee on Traffic and Transportation. Any Muni stop relocation would need to be coordinated with the Muni Street Operations/ Special Events Office. Any SamTrans or Golden Gate Transit stop relocation would need to be coordinated with the respective regional transit agencies.

Site-Specific Impacts. For each proposed project component, construction would add to the congestion in the area and affect motorized and non-motorized traffic. The effect of trucks on the roadways and local circulation would be minimized through implementation of traffic control and detour plans as part of previously adopted Mitigation Measure PC 2, traffic management plans as part of previously adopted Mitigation Measure PC 7, and the DTX Design Criteria. Based on site locations and configurations, the expected intensity and duration of construction, and the measures in the construction management plan, proposed project component construction would result in a not adverse effect/less-than-significant impact. Additional construction-related details specific to each proposed project component are summarized below.

- **Widened Throat Structure.** Construction associated with the widened throat structure is anticipated to be conducted in phases spanning approximately 2-1/2 years of the 45-month construction period. However, this site likely would be used for the full construction period because it would be one of the primary construction staging areas, including material extraction for the mined tunnel. At its maximum, construction activity could require the use of 38 trucks per day during the excavation phase, or an average of four to five trucks per hour. Construction staging areas would generally involve the same area that is currently being used for Phase 1 construction in the vicinity of Second and Howard Streets. As a result, adjacent sidewalks and parking lanes along Natoma, Howard, and Second Streets would be affected. Typically, where sidewalk closures are implemented for construction purposes, temporary (covered) pedestrian

walkways are established to maintain pedestrian connectivity through the area. It is expected that trucks would use Howard, First, and Second Streets to reach construction staging areas.

- **Extended Train Box**. Construction associated with the extended train box is anticipated to be conducted in phases spanning approximately 1-1/2 years of the 45-month construction period. At its maximum, construction activity could require the use of 25 trucks per day during the excavation phase, or an average of three trucks per hour. Construction staging areas have not been identified, but may include the adjacent sidewalks and parking lanes along Beale Street and Main Street. It is expected that trucks would use Mission, Howard, Main, and Beale Streets to reach construction staging areas.

- **Tunnel Stub Box**. Construction associated with the tunnel stub box is anticipated to be conducted in phases over the 45-month construction period. At its maximum, construction activity could require the use of 92 trucks per day during the construction and backfill phase, or 11 to 12 trucks per hour. Construction staging areas would largely occur at the Caltrain railyard, but would likely include the adjacent sidewalks and parking lanes along Townsend and Seventh Streets. It is expected that trucks would use Seventh, Berry, and Townsend Streets for travel to and from the railyard, adding to the congestion in this area and affecting motorized and non-motorized traffic. Stockpiling of excavated materials for this proposed project component would require a sufficiently large site, and the contractors would need to coordinate with the TJPA to identify a proximate site.

- **Realigned Fourth and Townsend Street Station and Ancillary Facilities.** Construction associated with the realigned Fourth and Townsend Street Station and vent structures is anticipated to be conducted in phases over the 45-month construction period. At its maximum, construction activity could require the use of 17 trucks per day during the construction phase, or approximately two trucks per hour. Construction staging would occur at the site. Construction of the realigned Fourth and Townsend Street Station and vent structures would require removal of existing employee parking, crew facilities, and bicycle parking, which could affect access to the Fourth and King Station. Caltrain and TJPA have coordinated on the development of the station plans, and TJPA has committed to reduce construction–related effects of the proposed project on the existing station and its access and operations. The preliminary cost estimates prepared for the proposed project (TJPA 2010) include up to $25 million to mitigate construction-related impacts of the Fourth and Townsend Station on existing Caltrain support facilities.

- **Vent Structure at Third and Townsend Streets and Adjacent Land Development**. Construction associated with the Third Street/Townsend Street intersection vent structure at either the northeast or southeast corner is anticipated to be conducted in phases spanning approximately a year over the 45-month construction period. However, this vent structure site likely would be used for the full construction period because it would be one of the primary construction staging areas, including material extraction for the mined tunnel. At its maximum, construction activity could require the use of 17 trucks per day during the construction phase, or approximately two trucks per hour. Construction staging for the vent structure would occur at the site; however, subsequent construction staging for the land development has not been determined. The site itself, along with adjacent sidewalks and parking areas along Townsend Street and Third Street, may be used for construction staging. Construction information regarding the potential mixed-use development has not yet been developed, but it is anticipated to have similar activity levels and staging requirements as the vent structure. It is expected that trucks would use Third and Townsend Streets to reach construction staging areas, adding to the congestion in this area and affecting motorized and non-motorized traffic.

- **Second and Harrison Streets Vent Structure**. Construction associated with the Second and Harrison Streets vent structure is anticipated to be conducted in phases spanning approximately a year over the 45-month construction period. However, this vent structure site likely would be used for the full construction period because it would be one of the primary construction staging areas, including material extraction for the mined tunnel. At its maximum, construction activity could require the use of 17 trucks per day during the construction phase, or approximately two per hour. Construction staging for the vent structure would occur at the site. The site itself, along with adjacent sidewalks and parking areas along Harrison Street and Second Street, may be used for construction staging. It is expected that trucks would use Second and Harrison Streets to reach construction staging areas.

- **Intercity Bus Facility**. Construction associated with the intercity bus facility is anticipated to be conducted in one phase, requiring approximately half a year, immediately following the completion of extended train box construction. At its maximum, construction activity could require the use of 17 trucks per day or approximately two trucks per hour. Construction staging areas have not been identified, but would likely be similar to those used for the extended train box, and may include the adjacent sidewalks and parking lanes along Beale Street and Main Street. Construction information regarding the potential residential or office building has not yet been developed, but it is anticipated to have similar activity levels and staging requirements as the intercity bus facility. It is expected that trucks would use Mission, Howard, Main, and Beale Streets to reach construction staging areas, extending the circulation disruption associated with the extended train box.

- **BART/Muni Underground Pedestrian Connector**. Construction associated with the underground pedestrian connector is anticipated to be conducted in phases spanning approximately 2 years. At its maximum, construction activity could require the use of 25 trucks per day. Construction staging areas have not been identified, but may include the adjacent sidewalks and parking lanes along Beale Street. It is expected that trucks would use Market, Mission, and Beale Streets to reach construction staging areas.

Cumulative Analysis

Cumulative Conditions with the proposed project are examined in this SEIS/EIR for a future horizon year (2040), and include background development growth and transportation network adjustments throughout the project area, the City, and the region. Development of the 2040 Cumulative Conditions scenario is described in Section 3.1, Introduction, of this chapter.

2040 Cumulative Conditions without the Proposed Project

Intersection Operations

By applying the calculated growth and adjustments to Existing Conditions, intersection level of service under 2040 Cumulative Conditions without the proposed project were derived as shown in Table 3.2-9.

During the weekday AM peak hour, the Third Street/Harrison Street, Beale Street/Mission Street, and Main Street/Howard Street intersections would operate at an unacceptable LOS F under 2040 Cumulative Conditions. The remaining eight study intersections would operate at acceptable LOS C or better during the weekday AM peak hour. During the weekday PM peak hour, the Third Street/Perry Street intersection would operate at an acceptable LOS B, and all of the remaining 10 study intersections would operate at an unacceptable LOS F under 2040 Cumulative Conditions.

Table 3.2-9
2040 Cumulative Conditions Intersection Levels of Service without the Proposed Project

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay[1]	LOS	Delay[1]
1. Fourth Street/Townsend Street	Signal	**F**	**>80.0 (N/A)**	**F**	**>80.0 (1.17)**
2. Third Street/Townsend Street	Signal	B	21.3	**F**	**>80.0 (1.41)**
3. Third Street/Bryant Street	Signal	--	--	**F**	**>80.0 (1.44)**
4. Third Street/Perry Street	OWSC[2]	--	--	B	11.8
5. Third Street/Harrison Street	Signal	**F**	**>80.0 (1.18)**	**F**	**>80.0 (1.22)**
6. Second Street/Bryant Street	Signal	--	--	**F**	**>80.0 (2.48)**
7. Second Street/Harrison Street	Signal	--	--	**F**	**>80.0 (2.27)**
8. Beale Street/Howard Street	Signal	C	30.6	**F**	**>80.0 (2.33)**
9. Beale Street/Mission Street	Signal	**F**	**>80.0 (1.15)**	**F**	**>80.0 (2.24)**
10. Main Street/Howard Street	Signal	**F**	**>80.0 (1.57)**	**F**	**>80.0 (3.86)**
11. Main Street/Mission Street	Signal	C	27.3	**F**	**>80.0 (1.06)**
12. 16th Street/Caltrain Tracks (at Seventh Street)[3]	Signal	**F**	**>80.0 (N/A)**	**F**	**>80.0 (N/A)**

Notes:
Bold indicates intersection operating at unacceptable level of service (LOS E or LOS F).
[1] Delay is presented in seconds per vehicle. Volume-to-capacity ratio is provided in parenthesis at locations where delay exceeds 80 seconds.
[2] OWSC = one-way stop control. Delay is presented for the worst minor approach to the intersection.
[3] LOS results from the PCEP EIR for the Year 2020 horizon year. V/C ratio for AM LOS was unavailable.
Source: San Francisco County Transportation Authority Travel Demand Model Run "CC2040HF1wLU" for Future 2040 Conditions; Peninsula Corridor Joint Powers Board 2015

Pedestrian Operations

By applying the calculated growth and adjustments to Existing Conditions, crosswalk and street corner level of service under 2040 Cumulative Conditions without the proposed project were derived as shown in Table 3.2-10 and Table 3.2-11.

As shown in Table 3.2-10, the west crosswalk at the Beale Street/Mission Street intersection would operate at unacceptable LOS E during the weekday PM peak hour. All other study crosswalks are projected to operate at acceptable LOS D or better during both the weekday midday and PM peak hours under 2040 Cumulative Conditions. As shown in Table 3.2-11, the northeast and northwest corners at the Beale Street/Mission Street intersection would operate at unacceptable LOS E during the weekday PM peak hour. All other study street corners would operate at acceptable LOS D or better during both the weekday midday and PM peak hours under 2040 Cumulative Conditions.

Table 3.2-10
2040 Cumulative Conditions Crosswalk Levels of Service without the Proposed Project

Intersection	Crosswalk	Midday Peak Hour		PM Peak Hour	
		LOS	Circ. Area[1]	LOS	Circ. Area[1]
1. Beale Street/Market Street	North	A	63.7	B	58.8
	East	A	93.2	A	102.5
	South	B	52.4	B	54.7
	West	A	296.9	A	117.6
2. Beale Street/Mission Street	North	B	41.1	C	37.5
	East	A	65.4	D	15.5
	South	B	43.9	C	34.0
	West	B	43.4	E	14.0

Note:
[1] Circulation area in square feet per pedestrian.
Source: Compiled by AECOM in 2014

Table 3.2-11
2040 Cumulative Conditions Street Corner Levels of Service without the Proposed Project

Intersection	Corner	Midday Peak Hour		PM Peak Hour	
		LOS	Circ. Area[1]	LOS	Circ. Area[1]
1. Beale Street/Market Street	Northeast	A	103.5	A	103.9
	Southeast	A	34.7	A	38.2
	Southwest	A	50.6	A	42.8
	Northwest	A	166.3	A	118.5
2. Beale Street/Mission Street	Northeast	B	12.2	E	2.8
	Southeast	A	14.1	D	5.7
	Southwest	B	11.1	D	3.4
	Northwest	C	9.4	E	2.9

Note:
[1] Circulation area in square feet per pedestrian.
Source: Compiled by AECOM in 2014

The one proposed project component that could have a material effect on pedestrian flows and movements is the underground pedestrian connector. Given the proximity of the Beale Street/Market Street and Beale Street/Mission Street study intersections to the proposed underground pedestrian connector, the proposed project at these two intersections would substantially reduce pedestrian volumes at study crosswalks and street corners. Therefore, implementation of this proposed project component would have a beneficial effect on cumulative pedestrian conditions.

Transit Operations

In the future, ridership on all local and regional transit lines and routes that serve downtown San Francisco is expected to grow. In addition, additional capacity/service frequency would have been implemented on several lines. As stated in the Transit Data for Transportation Impact Studies

memorandum, Muni routes to and from the greater downtown area would be approximately 73 percent utilized during the weekday AM peak hour and 75 percent utilized during the weekday PM peak hour. Regional transit providers connecting the East Bay Area with San Francisco (e.g., BART, AC Transit, ferries) are approximately 79 percent utilized during the weekday AM peak hour and 80 percent utilized during the weekday PM peak hour. Regional transit providers connecting the North Bay Area with San Francisco (e.g., Golden Gate Transit bus, ferries) would be approximately 80 percent utilized during the weekday AM peak hour and 77 percent utilized during the weekday PM peak hour. Regional transit providers connecting the South Bay Area with San Francisco (e.g., BART, Caltrain, SamTrans) would be approximately 58 percent utilized during the weekday AM peak hour and 59 percent utilized during the weekday PM peak hour. All transit data are provided for the peak direction of travel and are for 2035 conditions only (the San Francisco Planning Department does not have current 2040 projections).

Cumulative Impacts

Impact CU-TR-8: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on traffic. (No Adverse Effect/Less-than-Significant Impact)

The cumulative transportation analysis includes the City Planning Department's projections of growth in population and employment throughout the City. These projections include future development as anticipated by the area plans, which include the immediate surrounding neighborhoods that have potential to be affected by the proposed project.

The preceding Cumulative Conditions results indicate that cumulative traffic and pedestrian conditions would be significant, but that cumulative transit operations would be less than significant.

In considering the proposed project's contribution to significant cumulative traffic conditions, none of the proposed project components would introduce uses, design features, or operations that would result in permanent adverse/significant effects on future traffic operations. Tables 3.2-6, 3.2-7, and 3.2-8 show the net trip generation from the proposed project components with the greatest associated travel demand, which would largely be produced by adjacent land development that could occur at those sites. Net trips during the weekday AM peak hour would be reduced by 94 and during the weekday PM peak hour would be reduced by 32. The proposed project would result in a net reduction in the number of peak hour trips, and its contribution to the significant cumulative traffic impacts would be less than cumulatively considerable. Accordingly, the proposed project in combination with reasonably foreseeable development would result in a not adverse effect/less-than-significant impact on cumulative traffic operations.

Similarly, Tables 3.2-10 and 3.2-11 show that cumulative pedestrian volumes at certain crosswalks and intersection would be at unacceptable levels (LOS E). The proposed project component with the greatest effect on pedestrian circulation would be the underground pedestrian connector between the Transit Center and the BART/Muni Embarcadero Station. Because this proposed project component would allow pedestrians to travel below grade, it would reduce pedestrian volumes at study crosswalks and intersections. Thus, the proposed project's effect would not be cumulatively considerable, and the resulting cumulative conditions with the proposed project would be not adverse/less than significant.

Therefore, the proposed project would reduce the significant cumulative impact conclusion in the 2004 FEIS/EIR.

Impact CU-TR-9: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on Caltrain facilities, systems, or operations. (No Adverse Effect/Less-than-Significant Impact)

The cumulative transportation analysis included the City Planning Department's projected future development, anticipated by area plans as well as other transportation-related improvements. Cumulative project construction could disrupt transportation facilities and access, particularly at the Caltrain railyard, depending on routing and existing transportation facilities. Standard construction practices and regulations require construction contractors to identify, avoid, and minimize unplanned disruptions to transportation facilities and systems, and work with the San Francisco Department of Public Works, transportation agencies, and system operators to coordinate construction, to avoid substantial delays or disruption in access, service and travel.

Construction of the Phase 2 and the proposed project would be dependent on funding availability and may occur a number of years after 2020. Therefore, under the cumulative future conditions, the PCEP already would be constructed and operational at the Fourth and King Street Station. The PCEP, which completed its environmental review phase in early 2015, would electrify the existing diesel commuter rail service between the Fourth and King Street Station in San Francisco and the Tamien Station in San Jose, and would include relatively minor modifications to the existing configuration and activities at the Caltrain railyard. The PCEP would propel the new passenger vehicles using an OCS that would provide electrical power to the system.

The proposed project could result in two effects on the future, electrified Caltrain railyard and its operations. First, the proposed project would include a realigned Fourth and Townsend Station and a tunnel stub box that could result in temporary disturbance to the north side of the Caltrain railyard. TJPA has coordinated with Caltrain and determined that the proposed project may require temporary relocation of the future Caltrain OCS infrastructure in portions of the railyard during construction. This relocation would not be necessary if funding is identified for a separate part of the railyard. The City is exploring the potential for either reconfiguring or replacing the existing Fourth and King Station, to allow for redevelopment including housing and employment. The City's Railyard Alternatives and I-280 Boulevard Feasibility Study would evaluate removing the end of the I-280 freeway, extending Caltrain and HSR tracks underground, creating a surface boulevard allowing the reconnection of adjacent neighborhoods at the Fourth and King Station, and potentially redeveloping the Fourth and King Station. However, such future development remains at the conceptual planning phase, is not included in any adopted plan, and would be the subject of separate environmental review by Caltrain or the City and County of San Francisco, as appropriate. Funding has not been secured to study options beyond alternatives development, or to undertake or implement any aspect of the project; thus, the project is speculative and not reasonably foreseeable and was therefore not included in the cumulative impact analysis. If the City's plans to reconfigure or replace the railyard advance before the proposed project, then the Caltrain OCS poles and wires already would be moved, and construction of the proposed project would have no effect on the electrified operations at the railyard.

Second, the proposed project would require permanent realignment of approach tracks south of the Fourth and King Station, within the Caltrain right-of-way bordering Seventh Street. This work would include permanent relocation of OCS poles and wires along with the realigned tracks.

For both of these potential effects on Caltrain facilities, TJPA would coordinate with Caltrain to avoid and minimize the duration and extent of any potential disruption. The mitigation measures that were identified in the 2004 FEIS/EIS (see earlier summary of these measures under the discussion of the No Action Alternative) would be implemented during construction of the proposed project. In addition to these specific measures for traffic, pedestrian, and bicycle circulation and safety, TJPA has committed up to $25 million to fund measures to reduce construction-related effects on Caltrain facilities and operations. Use of these funds would be based on a mutual agreement between Caltrain and TJPA, and would evolve as the station plans for the realigned Fourth and Townsend Station are developed.

Therefore, the proposed project would result in less-than-significant cumulative impacts on Caltrain facilities, systems, or operations.

3.2.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Transportation (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that the Transbay Program would result in adverse project and cumulative traffic effects, but for pedestrian and construction-related transportation network impacts, no adverse effect would occur from the project with mitigation measures Ped 1 through Ped 7, PC 2, PC 4 through 7, and GC 1 through GC 4, previously adopted and incorporated into the Transbay Program. The proposed project with implementation of New-MM-TR-1.1, in addition to mitigation measures adopted as part of the 2004 FEIS/EIR, would not result in a new adverse effect not identified in the 2004 FEIS/EIR. As a result, the proposed project effects on transportation would not be adverse.
CEQA Summary	
Impact TR-1: Vehicle Traffic (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that the project would add substantial numbers of vehicles to some movements that determine overall LOS performance, resulting in a significant and unavoidable impact on intersection operations at seven intersections in the vicinity of the Transbay Terminal. The 2004 FEIS/EIR mitigation measure previously adopted and incorporated into the Transbay Program requires a contribution to the City's SFgo Transportation Management System, which is a citywide program to monitor and manage traffic circulation. The proposed project analyzed in this SEIS/EIR would have a potentially significant impact on intersection operations along 16th Street at Seventh Street, the Caltrain/turnback tracks, and Owens Street, and would result in a new impact not identified in the 2004 FEIS/EIR. With implementation of New-MM-TR-1.1, the impact to intersection operations along 16th Street in the vicinity of the at-grade Caltrain tracks would be mitigated to a less-than-significant level. The proposed project would not change the significance conclusion in the 2004 FEIS/EIR.
Impact TR-2: Transit Demand, Delays, or Operating Costs (Less than Significant)	The 2004 FEIS/EIR concluded that although demand may increase for some transit operations and decrease for others, the project would result in a less-than-significant impact on transit demand. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact on transit operations, and would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact TR-3: Pedestrian Conditions (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that although the project would reduce the LOS to poor at three corners, with mitigation, the project would have a less-than-significant impact on pedestrian safety. The proposed project analyzed in this SEIS/EIR would have a potential significant impact on pedestrian movements along 16th Street where additional trackwork south of the Caltrain railyard would be constructed, and would result in a potentially new significant impact to pedestrian movements not identified in the 2004 FEIS/EIR. New-MM-TR-1.1, in addition to the 2004 FEIS/EIR Mitigation Measures Ped 1 through Ped 7 previously adopted and incorporated into the Transbay Program, would reduce the impact to less than significant. The proposed project would not change the significance conclusion in the 2004 FEIS/EIR.
Impact TR-4: Bicycle Accessibility (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that bicycle trips would increase with the project, but the project would have a less-than-significant impact related to bicycle movement. The proposed project analyzed in this SEIS/EIR would have a potentially significant impact on bicycle movements along 16th Street where additional trackwork south of the Caltrain railyard would be constructed, and would result in a new significant impact not identified in the 2004 FEIS/EIR. New-MM-TR-1.1, in addition to the 2004 FEIS/EIR Mitigation Measures Ped 1 through Ped 7 previously adopted and incorporated in the Transbay Program, would reduce the impact to less than significant. The proposed project would not change the significance conclusion in the 2004 FEIS/EIR.

Impact TR-5: Parking and Loading (Less than Significant for loading)	CEQA has no requirement to evaluate parking-related effects. No significance conclusion is necessary regarding parking. The 2004 FEIS/EIR did not specifically address loading spaces but rather parking impacts in general, and concluded that a less-than-significant impact would occur from the project. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact on loading space and would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures for loading were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact TR-6: Emergency Access (Less than Significant)	The 2004 FEIS/EIR concluded that the project would add substantial numbers of vehicles to some movements that determine overall LOS performance, resulting in a significant and unavoidable impact on intersection operations at seven intersections in the vicinity of the Transbay Terminal. The 2004 FEIS/EIR did not specifically address emergency access impacts. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact on emergency response and movement, and would not result in any new significant impacts. No mitigation measures would be required for the proposed project analyzed in this SEIS/EIR.
Impact C-TR-7: Construction – Temporary Impacts to Surrounding Transportation Networks (Less than Significant)	The 2004 FEIS/EIR noted that construction of the project would affect transit operations, vehicular traffic, intersection LOS, local business access, parking, and pedestrian and bicycle circulation. The 2004 FEIS/EIR concluded that, with mitigation measures, project construction would have a less-than-significant impact on the transportation network. The proposed project analyzed in this SEIS/EIR would result in less-than-significant construction impacts related to the transportation network and operations. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond the 2004 FEIS/EIR Mitigation Measures PC 2, PC 4 though PC 7, and GC 1 through GC 4 previously adopted and incorporated into the Transbay Program would be required for the proposed project.
Impact CU-TR-8: Cumulative – Traffic (Less than Significant)	The proposed project in combination with other reasonably foreseeable development would result in less-than-significant cumulative transportation impacts, compared to the significant cumulative traffic impact conclusion in the 2004 FEIS/EIR.
Impact CU-TR-9: Cumulative – Caltrain (Less than Significant)	The proposed project in combination with other reasonably foreseeable development would result in less-than-significant cumulative impacts on Caltrain service and facilities and would not change the significance conclusion in the 2004 FEIS/EIR.

3.3 LAND USE AND PLANNING, WIND, AND SHADOW

3.3.1 Introduction

This section describes the land use, wind, and shadow setting of the project area, and the relationship to current and proposed land uses and adopted land use plans. The impact analysis considers how land use in the proposed project area might be affected by the construction and operation of the proposed project. Effects include changes to the overall land use and development pattern in the project area and consistency with area plans and zoning. In particular, the analysis focuses on the proposed project component locations and whether land use conditions or plans have changed since approval of the 2004 FEIS/EIR. Section 3.4, Socioeconomics, Population, and Housing, presents related information, describing land acquisition and displacement of existing land uses, and Section 3.15, Public Services, Community Services, and Recreational Facilities, presents information on public, institutional, and recreational land uses. Other discussions in this SEIS/EIR that are relevant to land use and neighborhood character, such as potential alterations to circulation patterns, visual quality, and noise and vibration, are presented in other sections of Chapter 3 (see Section 3.2, Section 3.5, and Section 3.12, respectively).

3.3.2 Affected Environment

Land Use Study Area

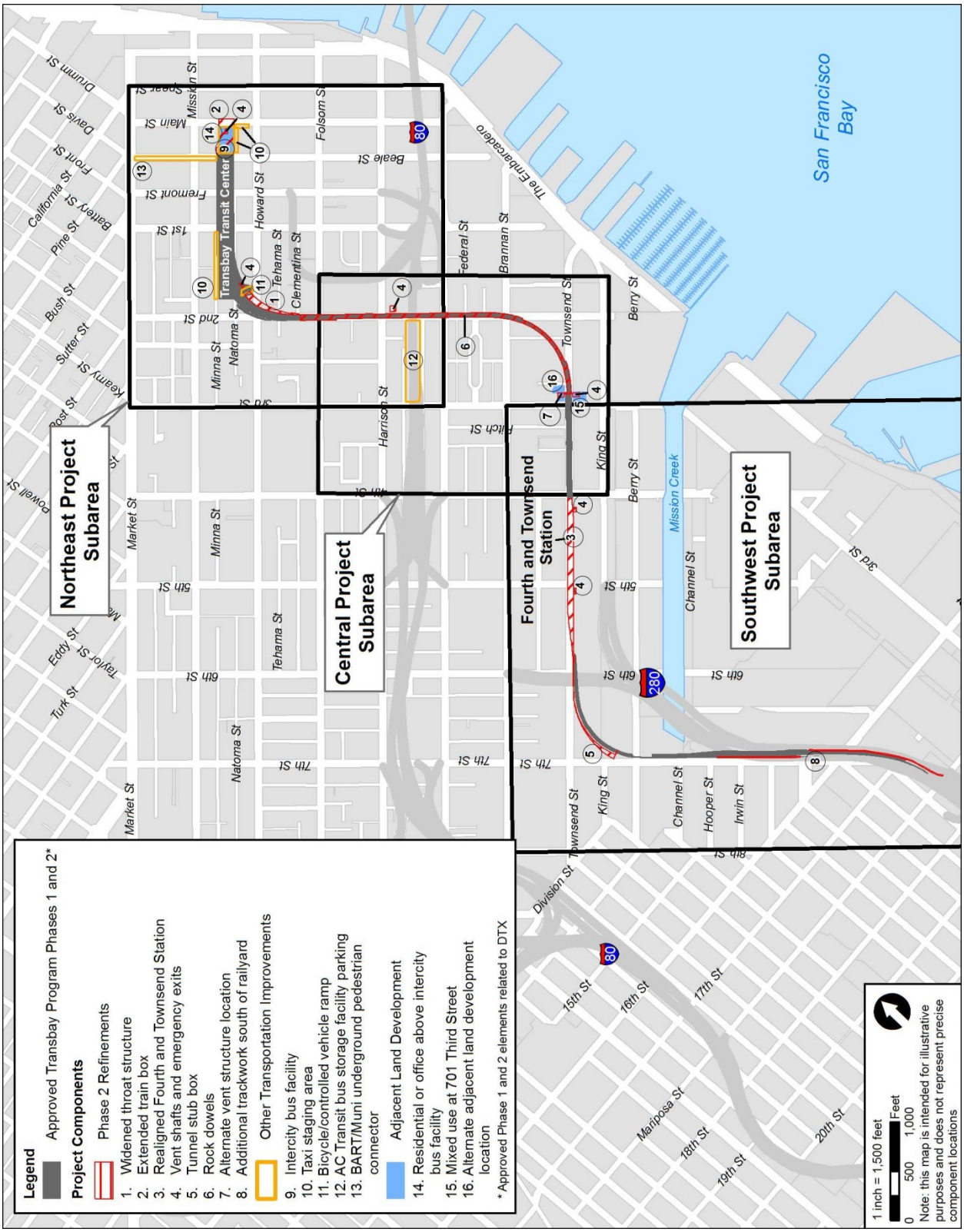
The land use study area (study area) encompasses properties that would be used for the proposed project and those properties immediately adjacent to the proposed project components that could be affected. The geographic boundaries of the study area and the location of each proposed project component are shown in Figure 3.3-1. The study area follows a linear path from the downtown Financial and Transit Center Districts, where the Transit Center is currently under construction, through the South of Market and Mission Bay areas along the route of the Downtown Rail Extension (DTX). The study area traverses many neighborhoods, all of which are guided by area-specific plans that are part of the City of San Francisco General Plan.

The land use study area was divided into three geographic subareas: the northeast project subarea, central project subarea, and southwest project subarea (Figure 3.3-1). The following sections present information on each subarea, including general boundaries, existing land uses within the project footprint and on potentially affected adjoining properties, land use plans guiding development, and recent and planned development.

Overview of Existing Land Uses in the Study Area

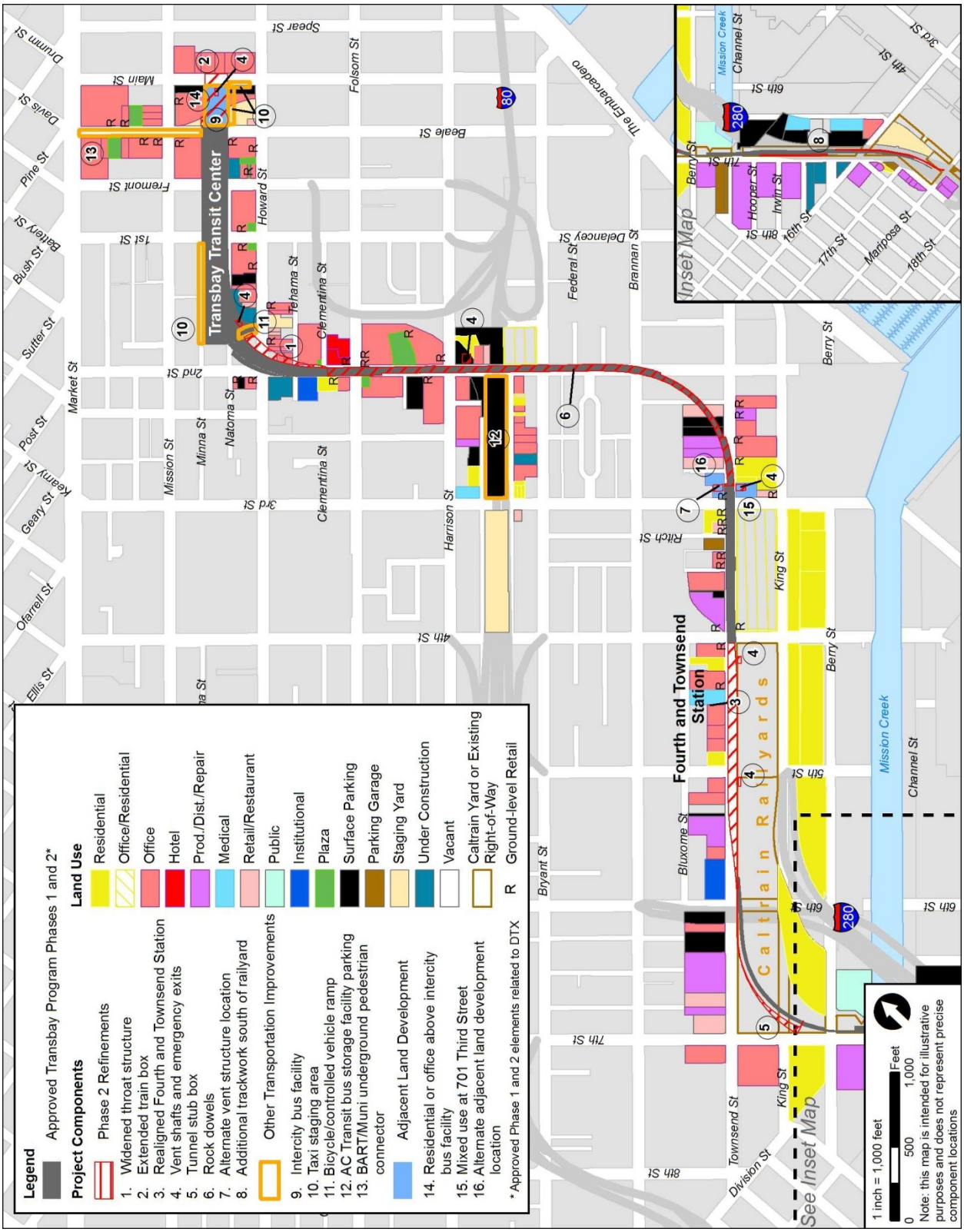
The study area is characterized by a mix of land uses, and generally includes office; retail; mixed-use; residential; live/work; light industrial; production, distribution, and repair (PDR)[1] warehousing/ distribution; and institutional; as well as surface parking lots, parking garages, and transportation-related infrastructure. The highest intensity uses are located to the northeast. Figure 3.3-2 shows the existing land uses immediately adjacent to the proposed project components. This area encompasses those land uses that would be most directly affected by the proposed project. The land use pattern in the larger study area is described below under "Existing and Planned Land Uses by Subarea and Proposed Project Component." As seen in the figure, office uses predominate, particularly around the Transit Center; a mix of office, retail, and commercial businesses define Second Street, and a mix of office, retail, and PDR

[1] PDR (production, distribution, and repair) refers to a variety of activities that occur in the City's industrially zoned areas, such as food preparation, light manufacturing, audio/visual work, transportation activities, residential and commercial construction support, and municipal services. PDR also includes arts activities, performance space work, furniture wholesaling, and design activities.



Sources: Compiled by AECOM and Seifel Consulting in 2014

Figure 3.3-1 Land Use Study Subareas and Proposed Project Components



Sources: Compiled by AECOM in 2015; City and County of San Francisco 2013

Figure 3.3-2 Project Area Existing Land Use

uses line the north side of Townsend Street. The majority of the study area's residential uses are concentrated south of the Caltrain railyard. Of the approximately 200 acres adjacent to the proposed project components, approximately 32 acres are in office use; approximately 21 acres are in mixed office/ residential use; approximately 3 acres are in retail/restaurant use; approximately 5 acres are in medical and institutional use; approximately 2 acres are in municipal use; the Caltrain railyard and existing right-of-way are approximately 51 acres; approximately 19 acres are in PDR use; approximately 19 acres are in surface parking use; and approximately 21 acres are in residential use. Most of the remaining approximately 27 acres are either being used by TJPA for Transbay Program Phase 1 construction staging or are under construction for various development projects approved by the City or the San Francisco Office of Community Investment and Infrastructure (OCII), the successor agency to the former San Francisco Redevelopment Agency. Approximately 4 acres are vacant in the immediate vicinity of the proposed project.

Existing and Planned Land Uses by Subarea and Proposed Project Component

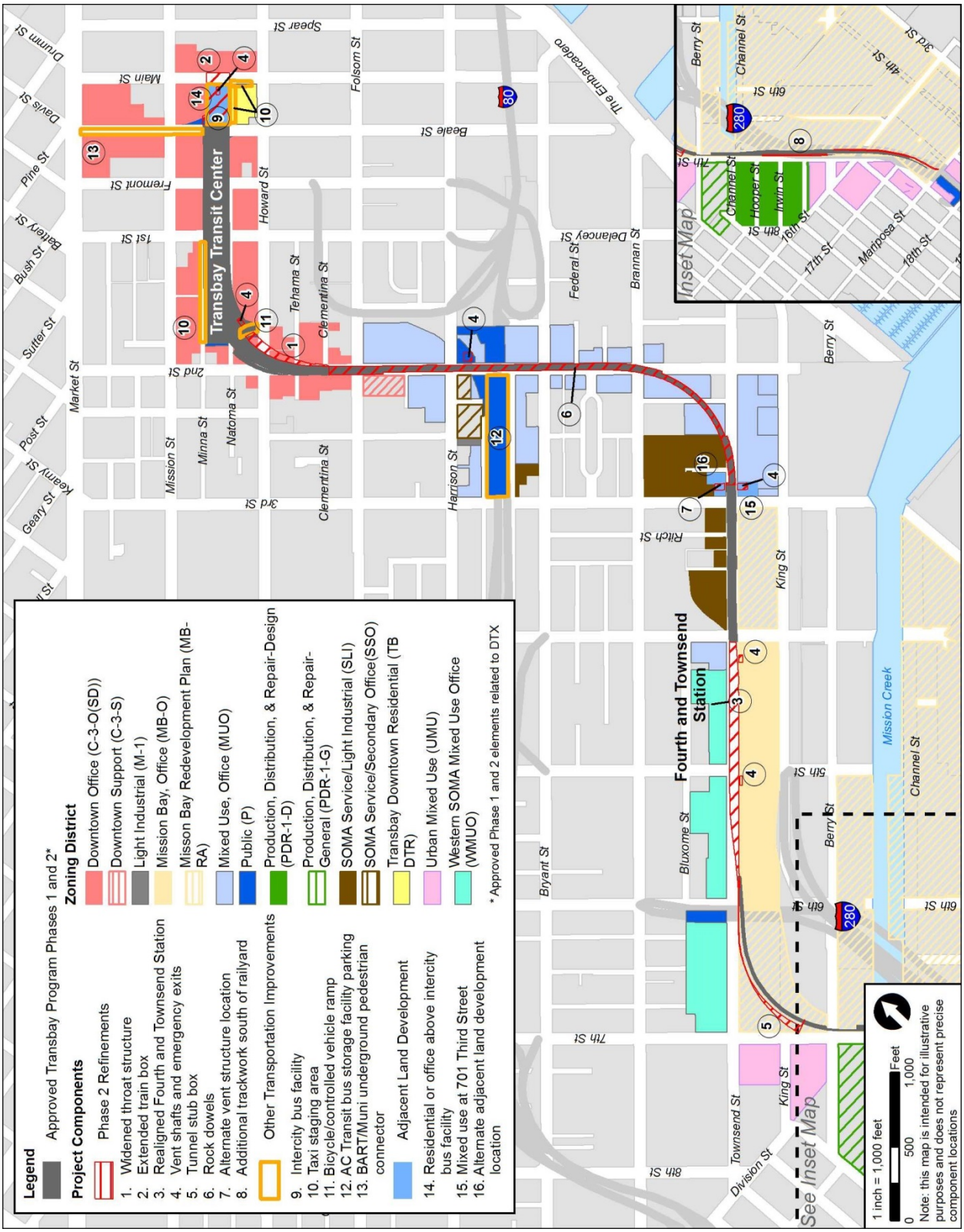
Northeast Project Subarea

The northeast project subarea is generally bounded by Market Street to the north, Spear Street to the east, Third Street to the west, and Folsom Street to the south, and contains the project components in the vicinity of the future Transit Center. This subarea is located within the southern Financial District of downtown San Francisco.

Existing and Zoned Land Uses. Existing land uses within the northeast subarea generally consist of office, retail, institutional (mostly educational) facilities, transportation-related infrastructure, residential high-rise buildings, and surface parking lots. Although much of the land within the northeast subarea is privately owned, the Transit Center and numerous parcels surrounding it are publicly owned, primarily by the TJPA and the state. Many of these parcels are being used to support construction of the Transbay Center in the short-term, and after they are no longer needed for that use, will be developed into office and mixed-use developments in accordance with City plans and zoning regulations. The northeast project subarea zoning districts are shown in Figure 3.3-3.

All of the proposed project component sites in this subarea are adjacent to or across the street from the Transit Center construction site, downtown office buildings, ground-floor retail, and parking uses. The Temporary Terminal is south of the proposed extended train box, intercity bus facility, and taxi staging area. Table 3.3-1 summarizes the existing and planned uses of the proposed project components in this subarea. Five of the project components in the northeast subarea would be located at or above-ground and could potentially affect land use and future development in their immediate vicinity. However, such future development remains only at the conceptual planning phase and would be the subject of a separate environmental review by Caltrain.

Area Land Use Plans and Recent and Planned Development. The northeast project subarea is primarily located in the new Transbay neighborhood, currently undergoing significant development and intensification. Development in the northeast subarea is primarily guided by the following area plans (as shown in Figure 3.3-4): the Transit Center District Plan (TCDP) and the Transbay Redevelopment Plan (San Francisco Redevelopment Agency 2005). The subarea is also part of the Downtown Area Plan (City of San Francisco 1984) (part of the City's General Plan), which encompasses most of the TCDP and the Transbay Redevelopment Plan areas. The TCDP area overlaps with the Transbay redevelopment project area and includes almost all of Transbay Redevelopment Plan area.



Sources: Compiled by AECOM in 2015; City and County of San Francisco 2013

Figure 3.3-3 Project Area Zoning

Table 3.3-1
Summary of Northeast Project Subarea Land Use by Proposed Project Components

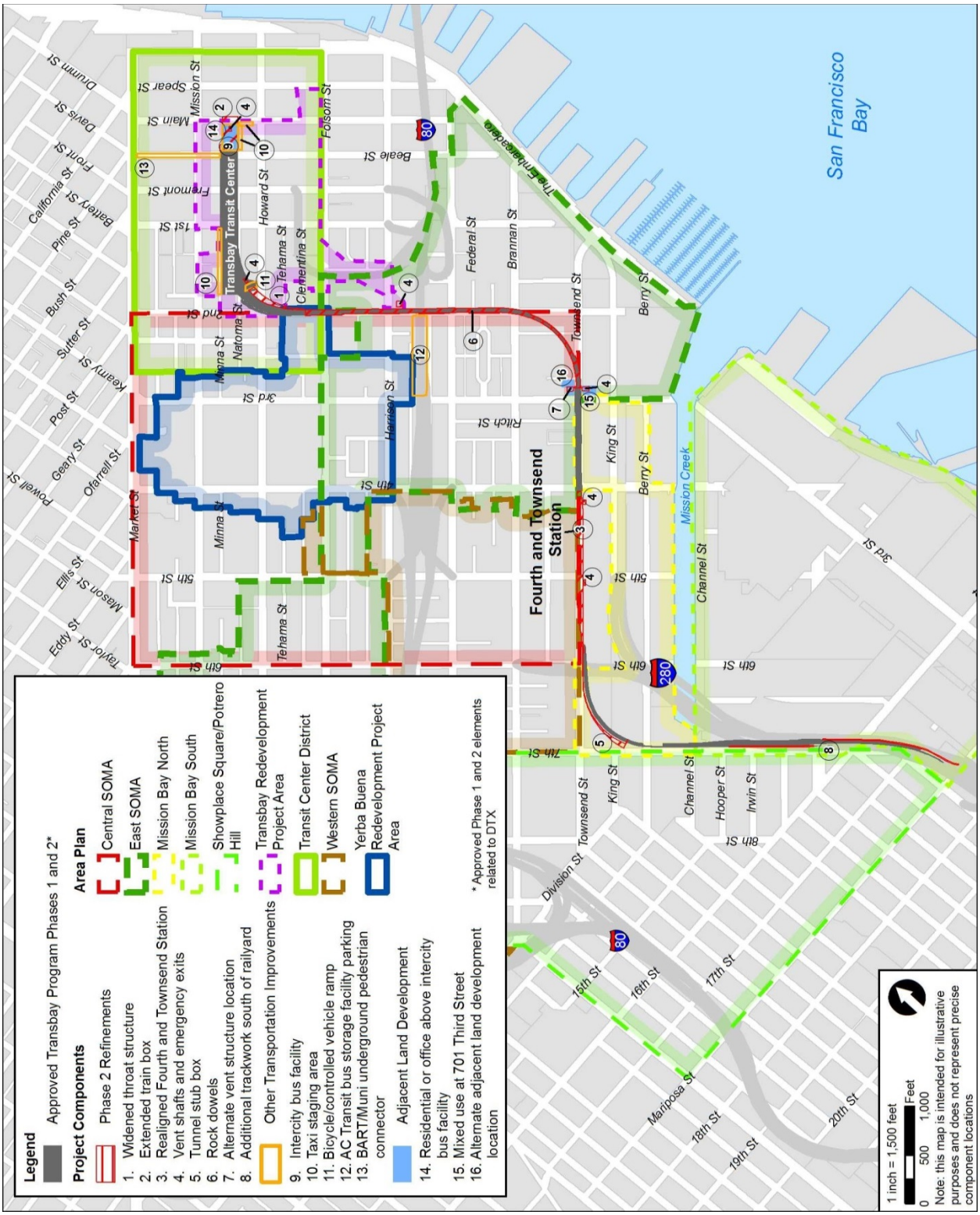
Project Component	Map Key	At or Above Ground[1]	Existing Land Use at Project Site	Adjacent Existing Land Uses	Zoning District
Widened throat structure[1]	1	No	Office (at 235 Second and 589 Howard Streets), surface parking lot	Office, retail, parking, Transit Center site	Downtown Office (Special Development)
Extended train box at the Transit Center[1]	2	No	Parking, Transit Center construction site, public street (Beale Street)	Office, retail, parking, Transit Center site	Downtown Office (Special Development)
Vent structure at Natoma and Main Streets	4	Yes	Parking, Transit Center construction site	Office, retail, parking, Transit Center site	Downtown Office (Special Development)
Vent Structures at Second and Natoma Streets	4	Yes	Transit Center construction site	Office, retail, parking, Transit Center site	Downtown Office (Special Development)
Intercity bus facility	9	Yes	Office (podium and utility-related uses at 201 Mission), parking, Transit Center construction site	Office, retail, parking, Transit Center site	Public, Downtown Office (Special Development)
Taxi staging area	10	Yes	Parking, Transit Center construction site	Office, retail, parking, Transit Center site	Transbay Downtown Residential
Bicycle and controlled vehicle ramp	11	Yes	Transit Center construction site	Office, retail, parking, Transit Center site	Public
Underground pedestrian connector from the Transit Center to BART/Muni	13	No	Public Street (Beale Street)	Office, retail, parking, Transit Center site	N/A, under Beale Street

Note:
[1] While these project components are below ground, their construction and the proposed intercity bus facility atop these components may have effects on existing land uses at the site, as described in Section 3.3.3, Environmental Consequences and Mitigation Measures.

The TCDP and Transbay Redevelopment Plan are the essential implementing documents for the new Transbay neighborhood. Together, these plans are intended to guide and facilitate the design, development, and construction of the Transit Center and the creation of a new downtown walkable neighborhood. The TCDP and Transbay Redevelopment Plan are also helping to guide the development of approximately 4,400 units of new housing (of which 1,200 will be permanently affordable) and more than 6 million square feet of commercial space, including the 60-story Transbay Tower, which will be the tallest building in San Francisco.

Central Project Subarea

The central project subarea is generally bounded by Folsom Street to the north, First Street to the east, Third Street to the west, and King Street to the south; it includes the project components that occur along Second Street. This subarea is located within the South of Market (SoMa) neighborhood of the greater downtown of San Francisco, extending from the southern Financial District to the north to Mission Bay.



Sources: Compiled by AECOM in 2015; City and County of San Francisco 2013

Figure 3.3-4 Area Plans

Existing and Zoned Land Uses. The central project subarea is located within SoMa, which is home to a mix of land uses, including business, entertainment, and living space. Originally established as a well-to-do neighborhood in the mid-1850s, SoMa was completely destroyed by the earthquake and fire of 1906 and subsequently rebuilt as a warehouse and working-class residential district. The portion of SoMa located within the central project subarea is now dominated by creative office, live/work lofts, retail, service commercial, and small light-industrial uses. The central project subarea zoning districts are shown in Figure 3.3-3.

The vent structure at 701 Third Street is surrounded by office, residential, and retail uses, and the alternate site at the northeast corner of Third and Townsend Streets is surrounded by office and retail uses. The vent structure at Second and Harrison Streets is located near Interstate 80 on-ramps and is surrounded by office, retail, and surface parking uses. The AC Transit bus storage facility parking is located on and near other surface parking that occurs underneath elevated portions of Interstate 80 and has a mix of office and retail uses in its immediate vicinity. Table 3.3-2 summarizes the existing and planned uses of the proposed project components in this subarea. Three of the project components in the central project subarea would be located at or above-ground and could potentially affect land use and future development in their immediate vicinity.

Table 3.3-2
Summary of Central Project Subarea Land Use by Proposed Project Components

Project Component	Map Key	At or Above Ground	Existing Land Use at Project Site	Adjacent Existing Land Uses	Zoning District
Vent structure at 701 Third Street	4	Yes	Retail (fast food restaurant)	Residential, office, retail	Mixed Use, Office
Alternate vent structure at 699 Third Street/180 Townsend Street	4	Yes	Office and retail	Residential, office, retail	SOMA Service-Light Industrial
Vent structure at Second and Harrison Streets	4	Yes	Surface parking lot; approved for residential and retail uses as part of the Transbay Program	Office, retail, traffic infrastructure, surface parking	Public
Rock dowels to temporarily anchor the tunnel (part of the DTX alignment)	6	No	Office, live/work lofts, residential, retail, service commercial, light industrial	Office, live/work lofts, residential, retail, service commercial, light industrial	Mixed Use, Office, Office, Downtown Office (Special Development), Downtown Support
Parking at AC Transit bus storage facility	12	Yes	Construction staging; approved for storage of AC Transit buses as part of the Transbay Program	Office, retail, residential, traffic infrastructure, surface parking	Public

Area Land Use Plans and Recent and Planned Development. As shown in Figure 3.3-4, land use of the parcels within the central project subarea is generally guided by the East SoMa Area Plan (City of San Francisco 2008a), adopted in 2008 as a part of San Francisco's Eastern Neighborhoods land use planning efforts.[2] The East SoMa Plan includes policies to retain space for existing businesses and residential uses while allowing space for new development, especially affordable housing.[3]

Recently, this subarea has seen a vast amount of change, especially in housing and creative office development. The East SoMa Area Plan and the proposed Central SoMa Plan (City of San Francisco 2013a) envision retaining space for existing businesses and residential uses while allowing space for new development, especially higher-density housing with a special focus on affordable housing. The northern section of this subarea is included within the Transbay Redevelopment Plan Area, which provides an overlay of land use designations on the vent structure site at Second and Harrison Streets and adjoining properties.

Southwest Project Subarea

The southwest project subarea is generally bounded by Fourth Street on the east, Townsend Street on the north, Seventh Street on the west, and Mariposa Street on the south. It is centered along the Caltrain Fourth and King Street Station and railyard, and the Caltrain rail line running from the railyard to Mariposa Street. This subarea is primarily located in the SoMa and Mission Bay areas of San Francisco.

Existing and Zoned Land Uses. Traversing the SoMa, Mission Bay, and Potrero Hill neighborhoods, the southwest project subarea is characterized by a wide variety of existing land uses, including a major regional transit hub, office, retail, mixed use, residential, PDR, institutional, park/open space, and parking. The Caltrain Fourth and King Street Station and railyard comprise the predominant land use in this subarea. The southwest project subarea zoning districts are shown in Figure 3.3-3.

A mix of land uses, including residential, mixed-use, office, and retail, are located on the properties north of the Caltrain facilities between Fourth and Seventh Streets. Buildings are mainly one or two stories, with a few newer buildings that are four to seven stories high. Table 3.3-3 summarizes existing and planned uses of the proposed project components in this subarea. Two of the project components in the southwest project subarea would be located at or above-ground and could potentially affect land use and future development in their immediate vicinity. Such future development remains only at the conceptual planning phase and would be the subject of a separate environmental review by Caltrain.

Area Land Use Plans and Recent and Planned Development. Development in the southwest project subarea is guided by the following area plans (as shown in Figure 3.3-4): East SoMa Plan, Mission Bay North Redevelopment Plan, West SoMa Community Plan (City of San Francisco 2013b), and the Showplace Square/Potrero Hill Area Plan (City of San Francisco 2008b). As part of the Mission Bay North Redevelopment Plan (San Francisco Redevelopment Agency 1998), the block directly east of the Caltrain station was recently developed as a mixed-use development with 595 condominium units. Residential and office projects have been approved and constructed to the west of the Caltrain station and railyard, in and near Showplace Square.

[2] Zoning districts originally established for SoMa in 1990 were refined by the East SoMa Area Plan, which is part of the Eastern Neighborhoods Plan.

[3] Parcels located on the west side of Second Street and the north side of Townsend Street are within the boundaries of the Central SoMa Plan, which is currently undergoing environmental review and plan refinement. The proposed Central SoMa Plan's goals and policies are intended to develop an integrated community vision for the southern portion of the Central Subway rail corridor, located generally in the vicinity of Fourth Street between Townsend and Market Streets (Figure 3.3-4).

Table 3.3-3
Summary of Southwest Project Subarea Land Use by Proposed Project Components

Project Component	Map Key	At or Above Ground	Existing Land Use at Project Site	Adjacent Existing Land Uses	Zoning District
Realigned Fourth and Townsend Street Station	3	No	Public street (Townsend Street)	Residential, office, retail, public facilities	NA, under Townsend Street
Vent structure at Fourth and Townsend Streets	4	Yes	Caltrain station and railyard	Residential, office, retail, public facilities	Mission Bay Office (MB-O), Public Facility
Vent structure at Fifth and Townsend Streets	4	Yes	Caltrain station and railyard	Residential, office, retail, public facilities	Mission Bay Office (MB-O), Public Facility
Tunnel stub box	5	No	Railyard	Residential, office, retail, institutional, industrial, public facilities	Mission Bay Redevelopment Area
Additional trackwork south of the Caltrain railyard	8	Yes	Caltrain right-of-way	Residential, institutional, industrial	NA, existing right-of-way

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning land use, planning, and local development, including new guidance issued since the 2004 FEIS/EIR.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on land use and planning, and to avoid or mitigate those impacts when feasible.

Senate Bill 375

Senate Bill (SB) 375 requires metropolitan planning organizations to develop a Sustainable Communities Strategy, to be included as a new element of the regional transportation plan, in order to reach the greenhouse gas reduction target established for each region by the California Air Resources Board. SB 375 has three major components: (1) using the regional transportation planning process to achieve reductions in greenhouse gas emissions consistent with Assembly Bill 32's goals; (2) offering CEQA incentives to encourage projects that are consistent with a regional plan that achieves greenhouse gas emission reductions; and (3) coordinating the regional housing needs allocation process with the regional transportation process while maintaining local authority over land use decisions.

Other legislation calling for consideration of land use, transportation, and greenhouse gas emissions can be found under Section 3.14, Greenhouse Gases and Climate Change.

Local

This section describes applicable elements of the San Francisco General Plan and Area Plans that contain land use goals and policies that guide development in the project area where the proposed project

components are located. The City has specific regulations in its Planning Code that address a development project's effect on wind and shadow, and those regulations are also described here.

San Francisco General Plan

The San Francisco General Plan, adopted by the Board of Supervisors, is a strategic and long-term document, broad in scope and specific in nature. The General Plan contains 10 elements (Housing, Commerce and Industry, Recreation and Open Space, Community Facilities, Urban Design, Environmental Protection, Transportation, Air Quality, Community Safety, and Arts) that provide goals, policies, and objectives for physical development within the City. In addition, the General Plan includes area plans that outline goals and objectives for specific geographic planning areas, such as the greater downtown area.

Downtown Area Plan

The Downtown Area Plan is designed to manage growth in downtown San Francisco and maintain the area's distinctive character and its livability. The plan encourages more residential development within the planning area, and also identifies locations for future commercial and secondary office uses in the area west of the Yerba Buena Center.

The City's Transit First Policy calls for accommodating future job growth in the downtown area with public transit rather than private automobiles. The Downtown Area Plan states that employment growth should not be accommodated by expanding street or bridge capacity or by lengthening the peak commute period. Instead, plan objectives and policies are aimed at encouraging an increase in the number of commuters per automobile and increasing the number and percentage of commuters who use public transit. The plan also includes a policy to build and maintain rapid transit lines from downtown to all suburban corridors and major activity centers in San Francisco.

The Downtown Area Plan's policies focus on eliminating, reducing, or controlling the negative effects of further downtown commercial development and recommend substantial changes in downtown zoning, which would control the height and bulk of new buildings and encourage the preservation of existing buildings. The Downtown Area Plan also sets policies for improving transportation, improving the pedestrian environment, and adding more open space. The Downtown Area Plan directs major office towers to be concentrated in the financial core north and south of Market Street and in the expanded area south of Market, known as the Southern Financial District.

Transbay Redevelopment Plan

The Transbay Redevelopment Plan was part of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Transbay Program) evaluated in the 2004 FEIS/EIR. The Transbay Redevelopment Plan encompasses approximately 40 acres and consists of the Transbay Residential Zone (Zone 1) and the Transbay Downtown Commercial (C-3) Zone (Zone 2). Zone 1 is under the jurisdiction of OCII. The Transbay Redevelopment Plan calls for the development of Zone 1, which consists of approximately 12 acres of property formerly occupied by portions of the Embarcadero Freeway, into a vibrant downtown neighborhood. When complete, this neighborhood will consist of new office space north of Howard Street, new housing south of Howard Street, new neighborhood retail space concentrated on Folsom Street, and a number of public improvements such as widened sidewalks and open spaces.

Zone 2 is primarily under the jurisdiction of the San Francisco Planning Department. The Transbay Redevelopment Plan calls for the revitalization of the area surrounding the former Transbay Terminal. The Transbay Redevelopment Plan focuses on a mix of uses to revitalize the area, support the transit program, add significant amounts of housing to the SoMa area, and add transit-oriented development. The redevelopment program also consists of various projects and programs.

Adopted in 2005, the Transbay Redevelopment Plan includes goals such as the elimination of blight; correction of environmental deficiencies; increased housing production; and facilitation of the design, development, and construction of the Transit Center.

Transit Center District Plan

In August 2012, the City adopted the TCDP, which is an Area Plan of the San Francisco General Plan. The TCDP supports and builds on the Downtown Area Plan's vision for the area around the Transit Center as the heart of the new downtown. The TCDP area consists of approximately 145 acres in the southern portion of the downtown Financial District, roughly bounded by Market Street, Steuart Street, Folsom Street, and a line to the east of Third Street. The TCDP enhances and augments the Downtown Area Plan's patterns of land use, urban form, public space, circulation, and historic preservation, and makes adjustments to this specific subarea based on the current understanding of issues and constraints facing the area, particularly in light of the Transit Center project.

Implementation of the TCDP involved rezoning much of the plan area (except most public districts, with the exception of the Transit Tower site and Redevelopment Plan Zone 1) to Downtown Office (C-3-O) Special Development. The plan area overlaps with the Transbay Redevelopment project area, described above. The TCDP includes all of the Transbay Redevelopment Project Area Zone 2, with the exception of a "tail" that extends south of Folsom Street (City of San Francisco 2012). Zone 2 is also coterminous with the TCDP Transbay C-3 Special Use District, which contains additional land use controls to implement the Transbay Redevelopment Plan (City of San Francisco 2012). The TCDP establishes new planning policies and controls for land use; urban form, including building height and design; street network modifications/public realm improvements; historic preservation; and district sustainability, including enhancement of "green" building standards, among other features. The TCDP also allows for height limit increases in subareas composed of multiple parcels or blocks within the plan area and much of the Transbay Redevelopment project area approved in 2004.

Eastern Neighborhoods Rezoning and Area Plan

The Eastern Neighborhoods Community planning process began in January 2002 in response to growing land use conflicts in the Mission, East SoMa, Showplace Square/Potrero, and Central Waterfront areas of the City. The primary goal was to develop new zoning controls for the industrially zoned land in these neighborhoods. The Eastern Neighborhoods Rezoning and Area Plans (Eastern Neighborhoods Plan) supports housing development in some areas previously zoned to allow industrial uses, while preserving an adequate supply of space for existing and future PDR employment and businesses (City of San Francisco 2010).

In East SoMa, the Eastern Neighborhoods Plan goals include encouraging an appropriate mix of uses, encouraging more neighborhood-serving businesses, attracting jobs for local residents, encouraging a mix of incomes in renter- and owner-occupied housing, increasing affordable housing opportunities, improving the character of streets, encouraging pedestrian safety, improving community facilities, enhancing open spaces, and offering a variety of transportation options. The mixed-use designation would protect and facilitate the expansion of commercial, manufacturing, and PDR uses in the area.

Central SoMa Plan

In 2011, the Planning Department began developing an integrated community vision for the southern portion of the Central Subway rail corridor, located generally in the vicinity of Fourth Street between Townsend and Market Streets. The Central SoMa Plan covers an approximately 260-acre area and proposes to build off the neighborhood's success while addressing many of its challenges, employing a comprehensive strategy that will address such issues as land use, building size and heights, transportation, the public realm (including sidewalks and open space), preservation of historic buildings, and

environmental sustainability (City of San Francisco 2014). Rezoning land uses in the plan area are intended to increase the amount of allowable development and to specifically generate more job growth.

In April 2013, the Planning Department published the Draft Central Corridor Plan. This Plan attempts to accomplish the following five goals for the central part of SoMa (City of San Francisco 2014):

1. Support transit-oriented growth, particularly workplace growth, in the Central Corridor Area.

2. Shape the area's urban form recognizing both city and neighborhood contexts.

3. Maintain the area's vibrant economic and physical diversity.

4. Support growth with improved streets, additional open space, and other elements of "complete communities".

5. Create a model of sustainable growth.

Mission Bay North Redevelopment Plan

San Francisco's Mission Bay neighborhood encompasses 303 acres of land between King Street and AT&T Park, the San Francisco Bay and Interstate 280, and Mariposa Street on the south. The Board of Supervisors established the Mission Bay North and South Redevelopment Plans in November 1998. Development is controlled through the redevelopment plans, designs for development, owner participation agreements, and interagency cooperation agreements. Mission Bay is a mixed-use, transit-oriented development. The land use categories in Mission Bay North are residential (i.e., mixed-use, including neighborhood-serving retail), retail (i.e., mixed-use, including entertainment uses, housing, City- and neighborhood-serving retail), open space, and public facilities. Residential development is nearly completed in Mission Bay North, with a mix of rental, for sale, and affordable housing projects.

San Francisco Planning Code

The San Francisco Planning Code, which incorporates by reference the City's Zoning Maps, implements the General Plan and governs permitted uses, densities, and configuration of buildings within the City. Permits to construct new buildings (or to alter or demolish existing ones) may not be issued unless the proposed project conforms to the San Francisco Planning Code, allowable exceptions are granted pursuant to provisions of the Planning Code, or amendments to the Planning Code are included as part of the project.

Wind

The San Francisco Planning Code establishes wind comfort and wind hazard criteria used to evaluate new development in four areas of the City: the C-3 Downtown Commercial Districts (Section 148), the Van Ness Special Use District (Section 243[c][9]), the Folsom-Main Residential/Commercial Supplemental Use District (SUD) (Section 249.1), and the Downtown Residential District (Section 825). The Transbay Program area is located within the C-3 Downtown Commercial District and the Downtown Residential District; therefore, it is subject to the wind criteria under Section 148. Section 148 of the Planning Code sets comfort levels of 7 miles per hour (mph)-equivalent wind speed for public seating areas and 11-mph-equivalent wind speed for areas of substantial pedestrian use, each not to be exceeded more than 10 percent of the time from 7 a.m. to 6 p.m. In addition to the comfort criteria, the Planning Code establishes a wind hazard criterion. The Planning Code also provides that any new building or addition in these areas of the City that would cause wind speeds to exceed the hazard level of 26-mph-equivalent wind speed (as defined in the Planning Code) for more than 1 hour of any year must be modified to meet this criterion. For a conservative approach, the San Francisco Planning Department refers to the wind

hazard criterion to determine the significance for CEQA purposes to evaluate wind effects of new development.

Shadow

Planning Code Section 295, the Sunlight Ordinance, was adopted in 1984, following voter approval of Proposition K. The ordinance prohibits the issuance of building permits for structures taller than 40 feet that would cast significant new shade or shadows on certain public open spaces that are under the jurisdiction of, or designated to be acquired by, the San Francisco Recreation and Park Commission, unless the San Francisco Planning Commission determines that the shade or shadow would have an insignificant adverse impact on the use of such property. These shade or shadow restrictions relate to the time between 1 hour after sunrise and 1 hour before sunset at any time of year.

3.3.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- physically divide an established community;
- conflict with any applicable land use plan, policy, or regulation by the City (including the General Plan, zoning ordinance, and applicable area plans and other plans) adopted for the purpose of avoiding or mitigating an environmental effect;
- conflict with any applicable habitat conservation plan or natural community conservation plan;
- alter wind in a manner that substantially affects public areas; or
- create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.

Issues Not Addressed Further in this SEIS/EIR

Habitat Conservation Plans. No habitat conservation plans or natural community conservation plans cover the study area; therefore, this issue is not discussed further.

Wind. The 2004 FEIS/EIR found that the Transbay Program would exceed the Planning Code's wind hazard criterion at one of the 61 test locations: test site number 57 in the Essex Street wind study subarea. That discussion in Section 5.1 Land-Use, Wind, and Shadow (pages 5-13 to 5-18) of the 2004 FEIS/EIR is hereby incorporated by reference (FTA 2004). Wind impacts may be caused by large building masses that extend substantially above their surroundings, and by buildings oriented so that a large wall catches a prevailing wind. Based on past wind analyses and expert opinions reviewed on other projects in San Francisco, projects with components shorter than approximately 80 feet in height do not have the potential to result in substantial changes to ground-level wind.

The height of most of the proposed project components would be less than 80 feet, except the vent shaft portion of the structure at 701 Third Street or the alternate vent structure at 699 Third Street/180 Townsend Street, which would be approximately 105 feet, and the vent shaft at Second and Harrison Streets, which would be approximately 101 feet. These proposed structures would be located in Mixed-Use Office (MUO), SoMa Service-Light Industrial, and Public districts, respectively. As described under "Regulatory Framework," the San Francisco Planning Code establishes wind hazard criteria for C-3

Downtown Commercial, Van Ness SUD, Folsom-Main Residential/Commercial SUD, and the Downtown Residential Districts. The proposed vent structures that would be taller than 80 feet would not be within these four districts; therefore, the wind hazard criterion set forth under the Planning Code and Mitigation Measure W 1 in the 2004 FEIS/EIR would not apply. All other above-ground proposed project components—also located in the Essex Street wind study subarea where the Transbay Program would exceed the wind hazard criterion—would be less than 80 feet tall. Because projects shorter than 80 feet in height do not have the potential to result in substantial changes to ground-level wind, no analysis of wind impacts is required for these proposed project components. Therefore, wind impacts are not evaluated further in this SEIS/EIR.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the land use and planning effects will be the same as those presented in Section 5.1 Land Use, Wind, and Shadow (pages 5-1 to 5-21) of the 2004 FEIS/EIR and subsequent addenda. A summary of those previously analyzed effects is provided below. Because land use impacts were determined not to be adverse under NEPA and less than significant under CEQA, no mitigation measures are required.

Physically Divide a Community. Development of the Transit Center involved acquisition of 11 parcels and demolition of five buildings that primarily housed commercial uses. Although land uses in the cut-and-cover sections of the DTX are primarily industrial, office, residential, retail, and parking, the majority of the land acquisition in this stretch is office space. Therefore, the No Action Alternative will not displace residential uses, social institutions, or community facilities that help to define a community. Furthermore, the affected commercial uses do not comprise an interdependent business district, but are part of a much-larger, rapidly changing high-intensity, mixed-use neighborhood. Consequently, the 2004 FEIS/EIR concluded that disruptions or divisions to the physical arrangement of the established community will not occur, and there will be no adverse effect under NEPA or a less-than-significant impact under CEQA.

Consistency with Existing Plans and Policies. Because the No Action Alternative supports City efforts to promote transit-oriented development and will be a key organizing feature in the relevant area plans, the 2004 FEIS/EIR concluded that no effect/no impact related to consistency with adopted plans and policies will occur, including the Transbay Redevelopment Area Plan, the San Francisco General Plan, and local area plans.

Neighborhood Character and Compatibility. An important goal of the Transbay Program redevelopment planning effort is to promote the development of a new mixed-use neighborhood in downtown San Francisco. The TCDP and Transbay Redevelopment Plan are facilitating the integration and intensification of residential and commercial uses along key thoroughfares with development of new open space, plazas, pedestrian-friendly streetscapes, and bicycle improvements. The No Action Alternative supports the establishment of this new neighborhood and, thus, the 2004 FEIS/EIR concluded that there will be a no adverse effect/less-than-significant impact on land use compatibility in the study area.

Wind and Shadow. Development under the No Action Alternative will introduce new buildings at heights and massing greater than current conditions, which can change the wind conditions in the area and will be an adverse/potentially significant impact. To mitigate this impact, the 2004 FEIS/EIR relied on the following mitigation measure:

- **W 1** – consider potential wind effects of an individual project in the Redevelopment Area and perform wind tunnel testing if necessary. If exceedances of the wind hazard criterion occur, require design modifications or other mitigation measures tailored to the individual needs of each project.

The 2004 FEIS/EIR concluded that there will be a no adverse effect/less-than-significant impact with respect to wind with the implementation of the mitigation measure. The No Action Alternative will not affect open spaces protected by Section 295 of the Planning Code. However, some publicly accessible, privately owned open spaces will experience an increase in shading during certain periods of the year. Because future development is subject to Sections 146, 147, and 295 of the Planning Code in assessing individual project shadow impacts, the 2004 FEIS/EIR concluded that the No Action Alternative will have a no adverse effect/less-than-significant impact on shadow.

Proposed Project

The proposed project components consist of Phase 2 refinements and other transportation improvements and land development at or adjacent to elements of the previously approved Transbay Program; therefore, the 2004 FEIS/EIR covers the area directly relevant to the proposed project. There are, however, new proposed project components outside of the previously approved project footprint. Consequently, some land uses at or directly adjacent to a proposed project component may have a different impact on a specific parcel of land than the 2004 FEIS/EIR. The following discussion identifies these similarities and differences.

Impact LU-1: The proposed project would not physically divide an established community. (No Effect/No Impact)

Tables 3.3-1 through 3.3-3 show relevant land use information about each proposed project component, including whether the component would be below-ground or above-ground.

Underground Proposed Project Components. Underground proposed project components include the widened throat structure at the Transit Center, the extended train box at the Transit Center, the realigned Fourth and Townsend Street Station, the tunnel stub box beneath the Caltrain railyard, the rock dowels primarily under Second Street, and the underground pedestrian connector under Beale Street. Because these proposed project components would be below street level, they would have no potential to physically divide the street-level land uses or interfere with interactions among those uses. Similarly, such underground proposed project components would not interfere with the local circulation system. Therefore, these components would not divide or contribute to the division of an established community, and there would be no effect/no impact.

Proposed Project Components at Street Level and/or an Expansion of Existing Uses. Several proposed project components would be at street level, would not project above-grade, and would involve re-use of the existing land use: the taxi staging area, the bicycle/controlled vehicle ramp, and the AC Transit bus storage facility parking.

- The additional trackwork south of the Caltrain railyard would be within Caltrain's existing right-of-way. This right-of-way already is used for Caltrain service and the additional trackwork would not introduce new uses or a physical barrier that would have the potential to divide surrounding land uses

- The taxi staging area would use the curbs along the streets surrounding the Transit Center. Therefore, this proposed project component would not alter existing land uses in the vicinity nor

introduce a physical barrier that would have the potential to divide the Transit Center from surrounding uses.

- The bicycle/controlled vehicle ramp would descend from Howard Street to the Lower Concourse level of the Transit Center. This proposed project component would be constructed in an area that is currently used for staging and access to the Transit Center construction site. As a future ingress/egress point to the Transit Center, beneath and immediately east of the overhead bus ramp serving the Bus Deck level, the bicycle/controlled vehicle ramp would not alter the existing land uses in the vicinity or introduce a physical barrier that would have the potential to divide the Transit Center from surrounding uses. Rather, the bicycle ramp would foster connectivity and accessibility to surrounding areas.

- Use of the approved AC Transit bus storage facility for nighttime and event parking, when AC Transit buses are not present, would extend the number of hours that this surface parking area is used; in this case, for public parking. This proposed project component would not involve any new physical improvements at the bus storage facility. Therefore, it would not alter the existing land uses in the vicinity or introduce a physical barrier that would have the potential to divide surrounding land uses. Increased use of this parking facility may have transportation and noise implications that are addressed in Section 3.2, Transportation, and Section 3.12, Noise and Vibration.

The street-level project components and/or the expansion of existing uses would not introduce physical barriers that would have the potential to divide surrounding land uses, and there would be no effect/no impact.

Above-Ground Proposed Project Components. All of the remaining proposed project components—Transit Center vent structures, the vent structure Third and Townsend Streets with adjacent land development, the vent structure at Second and Harrison Streets, the Fourth and Townsend Street Station vent structures, and the intercity bus facility with adjacent land development—involve facilities above the street level and could affect adjacent uses and physically separate surrounding uses.

The vent structures that would be constructed as part of the Transit Center and the Fourth and Townsend Street Station would be integral components of these larger public facilities. The Transit Center vent structures would be designed as part of the Transit Center and would be part of the new emerging Transbay neighborhood. Therefore, alteration of this proposed project component site and the surrounding area is already envisioned and approved as part of the TCDP and Transbay Redevelopment Plan. The vent structures and the Transit Center would not physically divide the community but would, instead, help define and unite the new neighborhood.

The Fourth and Townsend Street Station vent structures would be sited on the existing Caltrain railyard, which already physically separates PDR uses to the north and residential uses to the south. The addition of these new vent structures would be considered part of the transportation-related uses that already define the area, and would not substantially increase the existing separation north and south of the railyard. The vent structures would be a block apart (approximately 800 feet), and their frontage along Townsend Street would be approximately 50 feet and possibly two to three stories high. These proposed structures would be visually separate and isolated, and, therefore, would not be considered a physical barrier that would divide a community.

The three remaining proposed project components would occupy "infill" sites, each surrounded by existing land uses. The vent structures at either the southeast or northeast corner of Third and Townsend Streets and at Second and Harrison Streets, the intercity bus facility, and the adjacent land development at

the Third and Townsend Streets vent structure site and the intercity bus facility site would be developed in accordance with the City height and bulk regulations, which would indicate that they would be compatible with the development intensity and uses of nearby land uses and would not be expected to physically divide the area. Further, two of the sites, the intercity bus facility and the vent structure at Second and Harrison Streets, were previously approved for development as part of the Transbay Program in the 2004 FEIS/EIR, and no effects were identified with respect to physically dividing a community.

The above-ground project components would not introduce physical barriers that would have the potential to divide surrounding land uses, and there would be no effect/no impact.

Impact LU-2: The proposed project would not conflict with any applicable land use plan, policy, or regulation by the City adopted for the purpose of avoiding or mitigating an environmental effect. (No Effect/No Impact)

Overall impacts on land use and plans from the proposed project would be minimal, and none of the proposed project components would conflict with any applicable land use plan, policy, or regulation. Construction and operation of the proposed project components would be consistent with all plans and policies described above under "Regulatory Framework," which encourage development of the Transit Center, additional transit services, and a variety of transportation options and their interconnectivity; therefore, there would be no effect/no impact.

Of particular note, the proposed project would foster attainment of City development plans, as follows:

- The proposed project supports the City's Transit First Policy by extending rail services to the downtown area, the City's Bicycle Plan and Goal 4 of the Central SoMa Plan by providing convenient pedestrian and bicycle access to the Transit Center, and the Better Streets Plan by including a grade-separated connection between the Transit Center, the intercity bus facility, and the BART/Muni stations along Market Street.

- The realigned underground Fourth and Townsend Street Station and the tunnel stub box would incorporate the City's desire to accommodate possible future development at the existing railyard, improve Caltrain operations to the Transit Center, and enhance passenger orientation and wayfinding. The City is exploring the potential for either reconfiguring or replacing the existing Fourth and King Station, to allow for potential redevelopment that would provide housing and employment in the area. Although such development is not included in any adopted plans, at the City is in the conceptual planning phase and any plans would be subject to separate environmental review by Caltrain or the City and County of San Francisco, as appropriate. Funding has not been secured to study options beyond alternatives development, or to undertake or implement any aspect of the project; thus, the project is speculative and not reasonably foreseeable. The proposed project components would better accommodate future development in this area if plans for this development were adopted by the City.

- The intercity bus facility would create an additional, convenient intermodal transportation hub adjacent to the new Transit Center, furthering City, Metropolitan Transportation Commission, and Association of Bay Area Governments goals to enhance interregional connectivity.

- The extended nighttime and event parking at the AC Transit bus storage facility would support efforts of the TCDP to promote a new vibrant neighborhood, including retail, dining, and entertainment venues by increasing the supply of parking spaces.

- Adjacent land development at the intercity bus facility and at the vent structure at Third and Townsend Streets would support City efforts to promote transit-oriented growth in compliance

with the TCDP, the Transbay Redevelopment Plan, and the Central and East SoMa Plans. The program assumed for the possible future development is highly conceptual and at this stage only considers the type of use and development intensities that are permitted by adopted City plans and zoning regulations. Nevertheless, these assumptions are consistent with, and, therefore, serve to implement, the City's adopted plans.

Impact LU-3: The proposed project would be compatible with nearby existing land uses and neighborhood character. (No Adverse Effect/Less-than-Significant Impact)

As described in Impact LU-1, those proposed project components that are underground or at street level would not alter existing land use patterns or introduce new features that would substantially disturb or alter an existing land use and cause the proposed project to be considered incompatible. Consequently, these proposed project components are not discussed further in this section. Other specific issues that affect neighborhood character, such as potential alterations to circulation patterns, social cohesion and economic vitality, visual quality, and noise and vibration, are presented in other sections of Chapter 3.

In contrast to the above-mentioned proposed project components, the above-ground structures may affect surrounding land uses and neighborhood character. These components are the proposed vent structures, the intercity bus facility, and adjacent land development. These facilities have the potential to affect land uses around the proposed project component site due to their height and bulk, hours of operation, or level of activity, all of which can affect land use compatibility.

Vent Structures. The vent structures at the transit stations are part of other DTX facilities and would be integrated with rail operations. The vent structures at the Transit Center would either be within the existing Phase 1 footprint and currently in areas that are being used for construction staging, such as those at the west end of the train box, or proposed to be integrated into future transit facilities, such as the one at the east end of the train box that would be designed in coordination with the proposed intercity bus facility. These structures would be adjacent to transportation-related facilities associated with the Transit Center and the nearby surrounding land uses of retail and office space, which would not be considered sensitive to the size, appearance, or operations of a vent structure. Accordingly, the vent structures at the Transit Center would not be incompatible with nearby uses.

The vent structures associated with the Fourth and Townsend Street Station would be constructed as part of the station and would be sited within the existing Caltrain railyard. These vent structures would be compatible with the railyard and would not interfere with its operations. Land uses across Townsend Street to the north are a mix of retail, office, and PDR, none of which would be considered sensitive to the size, appearance, or operations of vent structures. The residential land uses to the south across the railyard and King Street would be physically separated from the vent structures by approximately 400 feet, which is sufficiently distant to avoid land use conflicts.

The remaining vent structure sites would be at 701 Third Street or an alternative site at the northeast corner of Third and Townsend Streets, and at Second and Harrison Streets. The Third and Townsend Street sites would be adjacent to existing offices that are not considered sensitive to land use changes; the Second and Harrison Streets site would be adjacent to an office building and a residential building. In each case, the proposed project sites would be in the immediate vicinity of mixed-use, office, light industrial, and public zoning districts, not residential zoning districts, where the size, appearance, and activity level could contrast with the proposed vent structures. For safety reasons, the height of the vent structures must be taller than adjacent uses to prevent unauthorized access to the DTX and to ensure that, in the event of a fire in the underground portions of the DTX system, smoke would be vented above nearby buildings. The vent structures would be utilitarian and industrial in appearance, and would contain emergency generators and intake and exhaust louvers along the facades of the structures so that, visually,

they may not be complementary to residential uses. Adjacent to commercial or industrial uses, these visual differences would be less noticeable and of less concern for occupants of the commercial and industrial uses. In recognition of land use and visual compatibility concerns, the DTX Design Criteria (TJPA, PMPC 2009), which govern the design, planning, and operational aspects of DTX and related facilities, explicitly acknowledge that above-grade building exteriors for ventilation and emergency egress structures may require specific contextual materials that are compatible with adjacent buildings. The street-level appearance of these structures would be coordinated with the City.

Vent structures would not be considered active uses, in the sense of a retail business or a high-intensity residential or mixed use with active foot traffic, vehicular movements, and long hours of operation. The vent structures are essential operational facilities for the underground DTX operations and would involve occasional maintenance activity. Consequently, even if near residential areas, their presence would not pose land use compatibility concerns that would substantially affect the operations and activity of adjacent land uses. Therefore, there would be a no adverse effect/less-than-significant impact with respect to land use compatibility.

Intercity Bus Facility. The intercity bus facility would be surrounded by the Transit Center, currently under construction to the west; the existing 201 Mission Street office tower to the north; and high-rise office buildings to the east. To the south, the existing land uses consist of surface parking and vehicular access to the 201 Mission Street building and public lands that are currently being used for construction staging for Phase 1 of the Transbay Program. These surrounding uses are not considered to be sensitive uses that would notice and/or be affected by the size, appearance, activities, and hours of operation associated with a bus facility. Once operational, the intercity bus facility would be highly compatible and supportive of the Transit Center, and each would be high-activity uses with extended hours of operation. This activity level involving foot and vehicular traffic throughout the area would not interfere with or alter the activities or operations of the neighboring high-rise office buildings.

The land to the south of the intercity bus facility is planned for high-rise office uses, similar to the uses to the north and east of this proposed project component. Accordingly, for the same reasons cited above, the intercity bus facility and the future use to the south would not be incompatible and there would be a no adverse effect/less-than-significant impact.

Adjacent Land Development. The adjacent land development at two of the proposed project component sites would be planned in accordance with City land use plans and regulations. Because they would not require changes to zoning, the future uses at these sites (i.e., residential or office above the intercity bus facility; and retail with residential or office uses at the 701 Third Street vent structure site or retail, professional offices, and similar uses at the alternate vent structure site at 699 Third Street and 180 Townsend Street) would be compatible with adjacent uses and consistent with the neighborhood character because they would be similar in use, appearance, and operations/level of activity. In addition, adjacent land development at two of the proposed project sites would be consistent with and would build on transit-oriented development policies outlined in the Central SoMa Plan. Therefore, the adjacent land development would have no adverse indirect effect under NEPA and a less-than-significant impact under CEQA with respect to land use compatibility.

Impact LU-4: The proposed project would not create a new shadow in a manner that would substantially affect the use of any park or open space under the jurisdiction of the San Francisco Recreation and Park Department, publicly accessible open space, outdoor recreation facility, or other public area. (No Effect/No Impact)

No parks are under the jurisdiction of the San Francisco Recreation and Park Department in the immediate vicinity of any of the proposed project components. The closest Section 295 park is Yerba

Buena Gardens, two blocks from the Transit Center. The proposed project components that would be over 40 feet in height would include the vent structure and adjacent development associated with 701 Third Street or the alternate site, and the vent structure at Second and Harrison Streets. These vent structures are designed so that they would project above the adjacent development on a smaller footprint than its base, resulting in a narrow shaft. The vent shafts would not cast shadows farther than the adjacent low- to mid-rise buildings currently do. Because of the distance from these sites (0.4 and 0.6 miles for Second and Harrison Street and 701 Third Street/alternate sites, respectively), no possibility of shadows being cast on Yerba Buena Gardens would occur. Therefore, the proposed vent structures would have no impact on parks protected by Section 295.

The proposed intercity bus facility and adjacent land development would be located just east of and adjacent to the Transit Center. City Park would occupy the roof level of the Transit Center, at an elevation of approximately 70 feet. City Park would be the only public open space in the proposed project area, although it would not be an open space that would be subject to Section 295 of the Planning Code. Because of the intercity bus facility's height and proximity to City Park, however, this proposed project component is discussed with regard to its potential effect on City Park. The remaining proposed project components would create no shadow impacts on City Park, and they are not discussed further. The intercity bus facility in combination with the development potential above would allow for development of a structure with a maximum height of 75 feet. The proposed intercity bus facility and additional development potential would be only slightly higher than the elevation of City Park (approximately 5 feet) and, therefore, would not cast shadows onto the park. Because of the slight height difference and the location of the intercity bus facility and adjacent development east of City Park, a shadow could be cast in the direction of City Park only in the early morning hours when the sun is relatively low on the horizon. No potential would exist for this to occur, however, because the high-rise buildings that are east of this proposed project component would block the early morning sun. Consequently, no shadow effect/impact on City Park would occur. In summary, the proposed project would not create a new shadow in a manner that would affect the use of any park or open space, publically accessible open space, outdoor recreation facility, or any other public area subject to Section 295 of the Planning Code.

Cumulative Analysis

Impact CU-LU-5: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative land use impacts. (No Adverse Effect/Less-than-Significant Impact)

The geographic context for this cumulative land use analysis consists of the Transbay Program, the TCDP area, the Central SoMa Plan, East SoMa Plan area, and Mission Bay North Plan areas, which encompass the neighborhoods of the proposed project components. This study area reflects the nature of the proposed project components and the expectation that their land use effects would be experienced within a relatively small geographic area.

The cumulative study area is an area defined by changing land use patterns, character, and intensity. Reasonably foreseeable projects in the cumulative study area are described in Section 3.1, Table 3.1-1, and the number of projects in this part of the City is reflective of its evolving nature. The types of uses and the intensity of the new development in terms of height, density, and bulk are, however, consistent with the City's planning efforts and the area plans that guide growth in this area. Land use and zoning within the cumulative study area follow the land use, circulation, and development guidelines in the identified area plans. These plans are intended to direct and facilitate design, development, and redevelopment within the plan areas, and to develop zoning and land use controls to reduce land use conflicts. Development in the cumulative study area would not be expected to have an adverse effect on land use because such development would comply with the applicable area plan.

The proposed project and other cumulative projects would be planned and developed in accordance with City plans and zoning and other development requirements, which are adopted in part to avoid land use conflicts and potential nuisances. Since these plans and development projects, in combination with the proposed project, would not physically divide an existing community, would not introduce new land use conflicts, and would reshape the land use character of the plan areas and the cumulative study area in a manner consistent with the long-term vision of the City, the cumulative land use effects would not be adverse or significant.

3.3.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Land Use and Planning, Wind, and Shadow (Not Adverse)	The 2004 FEIS/EIR concluded that no adverse effect would occur on land use compatibility because the Transbay Program would support the establishment of a new mixed-use neighborhood in downtown San Francisco. Wind impacts would be reduced with mitigation measure W-1, previously adopted and incorporated into the Program. The proposed project analyzed in this SEIS/EIR would not introduce new adverse land use, wind, or shadow effects. Therefore, the proposed project would not result in any new adverse effects not identified in the 2004 FEIS/EIR or change the effects in the 2004 FEIS/EIR. No mitigation measures would be required for the proposed project.
CEQA Summary	
Impact LU-1: Physically Divide an Established Community (No Impact)	The 2004 FEIS/EIR concluded that the Transbay Program would result in a more cohesive neighborhood with a mixture of residential and commercial activities. The 2004 FEIS/EIR concluded that a less-than-significant impact would occur in terms of physically dividing the community. The proposed project analyzed in this SEIS/EIR would have no impact in terms of physically dividing an established community. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact LU-2: Conflict with Applicable Land Use Plan, Policy, or Regulation (No Impact)	The 2004 FEIS/EIR concluded that no impact would occur related to consistency with adopted plans and policies, including the Transbay Redevelopment Area Plan, the San Francisco General Plan, and local area plans, because it would support the City's efforts to promote transit-oriented development and would be a key organizing feature in relevant area plans. The proposed project analyzed in this SEIS/EIR would result in no impact related to conflicts with any applicable land use plan, policy, or regulation by the City. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact LU-3: Compatibility with Nearby Existing Land Uses and Neighborhood Character (Less than Significant)	The 2004 FEIS/EIR concluded the Transbay Program would result in a less-than-significant land use compatibility impact, because it would support the establishment of a new mixed-use neighborhood in downtown San Francisco. The proposed project analyzed in this SEIS/EIR would result in a less-than-significant land use and neighborhood character impact. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact LU-4: Shadows (No Impact)	The 2004 FEIS/EIR concluded that the Transbay Program would not affect open spaces protected by Section 295 of the Planning Code, although some publicly accessible, privately owned open spaces would see an increase in shadows during certain periods of the year. Future development would be subject to the Planning Code in assessing individual project shadow impacts. The proposed project analyzed in this SEIS/EIR would create no shadow impact. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.

Impact CU-LU-5: Cumulative – Land Use (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative land use and planning impacts., The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.

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3.4 SOCIOECONOMICS, POPULATION, AND HOUSING

3.4.1 Introduction

Population and demographic characteristics provide information about the area's social context. This section presents a demographic profile of the proposed project area, including age, household, and disability characteristics, as well as ethnicity and income. This section also analyzes employment characteristics. The impact analysis considers how the population, jobs, and fiscal conditions in the City and the proposed project area might be affected by construction and operation of the proposed project. Section 3.3, Land Use and Planning, Wind, and Shadow, also includes analysis that is relevant to the overall social and economic effects of the proposed project. Specifically, that section addresses whether the proposed project components would physically divide an established community and whether the proposed project would be consistent with applicable neighborhood and district plans. Section 3.18, Environmental Justice Communities, also includes relevant analysis that explores whether the proposed project components would affect low-income or minority populations, and whether there may be disproportionately high and adverse human health or environmental effects on these populations. This analysis focuses on proposed project component locations and whether socioeconomic conditions have changed since approval of the 2004 FEIS/EIR.

In addition, children are afforded particular consideration pursuant to Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks." Specifically, federal actions must be assessed for disproportionately high and adverse environmental health and safety risks that may affect children. This analysis focuses on proposed project component locations and whether disproportionate risks to children are present and/or if conditions have changed since approval of the 2004 FEIS/EIR.

3.4.2 Affected Environment

Study Area

The entire project area is within the City and County of San Francisco, California. For purposes of the socioeconomic analysis, the proposed project area is defined to include all of the U.S. Census tracts within 0.25 mile of each of the proposed project components (see Figure 3.4-1). The proposed project area has nine census tracts with some portion overlapping the 0.25-mile buffer: 105, 117, 178.1, 180, 226, 227.02, 607, 611, and 615. Although only a portion of each of these nine census tracts is included within the proposed project area, this section includes data for all nine census tracts to be more inclusive and thus conservative in identifying potential impacts on existing residents and businesses in the proposed project area.[1]

Population, Employment, and Housing

San Francisco's population and demographic characteristics are described in this section. Compared to other cities in California, San Francisco is more densely populated, with a population of approximately 805,235 in an area covering only 49 square miles. San Francisco is the central city of a nine county region containing approximately 7.2 million people, and accounts for approximately 11.3 percent of the regional population. Between 2000 and 2010, the City's population increased approximately 3.5 percent, while

[1] None of the census tracts is completely within a 0.25 mile distance from the proposed project, and less than 50 percent of census tracts 105, 178.01, 226, and 611 are within the 0.25 mile distance from the proposed project components. Refining the geography to the census tract block groups within 0.25 mile provides a better reference for the variance between the project area used in the analysis versus the actual geographic area. The population for the related census tract block groups is 22,658, which is approximately 30 percent less than the population for the census tracts.

Sources: City and County of San Francisco 2013; U.S. Census Bureau 2010; compiled by AECOM in 2015

Figure 3.4-1 Census Tract Map

regional population growth was 5.4 percent. Compared to regional population characteristics, San Francisco's population is older on average. Seventeen percent of the residents are younger than 18 compared to 22 percent in the region, and 14 percent are older than 65, somewhat above the 12 percent average for the region.

Based on data from 2011 (U.S. Census Bureau 2011), the socioeconomic study area is estimated to have a current population of approximately 31,900 residents who live in 21,500 households. Of these residents, approximately 17,000 are employed, and approximately 2,300 residents live and work in the same census tract, while 14,700 commute to other parts of the City or beyond for work (see Table 3.4-1).

Table 3.4-1
Existing Project Area and Citywide Labor Force Characteristics

	Project Area	San Francisco
Employed in the Area	238,101	538,759
Living in the Area	16,971	356,170
Employed and Living in the Area	2,267	216,910
Employed in the Area but Living Outside	235,834	321,849
Living in the Area but Employed Outside	14,704	139,260
Unemployment Rate	7.8%	8.0%
Source: U.S. Census Bureau 2011		

As shown in Table 3.4-2, businesses and institutions in the City support approximately 540,000 primary jobs.[2] The City's largest employment sector is professional, scientific and technical services representing approximately 15 percent of citywide jobs. Accommodation and food services is the second most significant industry, and the only other industry with at least 10 percent of citywide jobs.

Based on data from 2011 (U.S. Census Bureau 2011), nearly one-half of the City's jobs, more than 240,000 primary jobs, are located in the proposed project area. Professional, scientific and technical services is the largest industry in the proposed project area, representing approximately 26 percent of all jobs there. Other industries with more than 10 percent of jobs in the project area are finance and insurance (14 percent) and administration and support, waste management and remediation (12 percent). Accommodation and food services is a lower employment generator in the proposed project area as compared to the City (8 percent of jobs in project area compared to 10 percent citywide).

Age Characteristics

As illustrated in Table 3.4-3, the median age of the City's population is 38.5 years, while the median age in the nine census tracts comprising the proposed project area ranges from approximately 33 years to 70 years. Two census tracts in the proposed project area have a higher percentage of residents older than 65, and four census tracts have a higher median age than the 38.5 year median age citywide. Census tracts 178.01 and 611 include elderly and low-income housing complexes, which account for the notable percentage of population over 65. Table 3.4-3 also shows that the percentage of children in the City is greater than the percentage of children in the project area, and no census tract in the proposed project area has a higher percentage than the citywide percentage of 13 percent.

[2] According to OnTheMap, a primary job is the single job with the highest pay for a specific individual.

Table 3.4-2
Existing Project Area and Citywide Employment by Business Sector

	Project Area		San Francisco	
	Number	**Percent**	**Number**	**Percent**
Utilities	6,048	2%	9,358	2%
Construction	4,802	2%	14,136	3%
Manufacturing	3,514	1%	8,588	2%
Wholesale Trade	5,961	2%	13,009	2%
Retail Trade	12,779	5%	38,768	7%
Transportation and Warehousing	2,114	1%	13,189	2%
Information	14,859	6%	22,181	4%
Finance and Insurance	35,047	14%	41,839	8%
Real Estate and Rental & Leasing	4,744	2%	11,462	2%
Professional, Scientific, and Technical Services	62,967	26%	80,278	15%
Management of Companies and Enterprises	14,256	6%	16,212	3%
Administration & Support, Waste Management, and Remediation	28,525	12%	37,968	7%
Educational Services	5,672	2%	50,366	9%
Health Care and Social Assistance	4,241	2%	49,197	9%
Arts, Entertainment, and Recreation	3,472	1%	12,195	2%
Accommodation and Food Services	19,958	8%	55,050	10%
Other Services (excluding Public Administration)	8,384	3%	32,884	6%
Public Administration	4,624	2%	31,755	6%
Total	**242,101**	**100%**	**538,759**	**100%**

Source: U.S. Census Bureau 2011

Table 3.4-3
Project Area and Citywide Age Characteristics in 2010

Census Tract	Total Population	Percent Under 18	Percent Over 65	Median Age[a]
105	2,685	6%	3%	50.2
117	1,783	7%	2%	43.6
178.01	3,499	2%	58%	70.4
180	4,221	4%	3%	36.8
226	1,534	7%	3%	37.3
227.02	2,060	12%	11%	38.2
607	9,083	8%	6%	33.1
611	4,307	12%	32%	55.2
615	11,502	6%	5%	35.4
Project Area	**40,674**	**7%**	**14%**	**38.2**
San Francisco	805,235	13%	14%	38.5

Source: U.S. Census Bureau 2010
Note:
a. Median age for proposed project area accounts is the median age accounting for total population.

Race and Ethnicity

The racial composition of the relevant census tracts varies, but the majority of the population in the City and the proposed project area identify themselves as either Caucasian or Asian (see Table 3.4-4). Since 2000, the proportion of the non-Caucasian and Hispanic populations has remained steady in both the City and the proposed project area (see Table 3.4-5). Residents identifying as Asian have increased over this time period in both the City (from 31 percent to 33 percent) and in the proposed project area (from 40 percent to 42 percent). Census tract 178.01 encompasses a portion of the City's Chinatown neighborhood, and Census tract 611 includes low-income residential complexes serving large Asian populations, among others.

Table 3.4-4
Project Area and Citywide Race and Ethnic Characteristics by Percentage in 2010

	Race Characteristics (%)						Ethnic Characteristics (%)
Census Tract	**Caucasian**	**African American**	**Native American**	**Asian**	**Native Hawaiian**	**Other**	**Hispanic**
105	65%	2%	0%	29%	0%	4%	6%
117	39%	6%	1%	47%	0%	7%	10%
178.01	28%	3%	0%	65%	0%	4%	4%
180	50%	21%	1%	17%	0%	10%	14%
226	75%	4%	1%	14%	1%	6%	9%
227.02	78%	3%	0%	12%	0%	8%	12%
607	49%	4%	0%	39%	0%	8%	8%
611	6%	3%	0%	90%	0%	2%	2%
615	59%	4%	0%	31%	0%	6%	7%
Project Area	**46%**	**6%**	**0%**	**42%**	**0%**	**6%**	**8%**
San Francisco	49%	6%	1%	33%	0%	11%	15%

Source: U.S. Census Bureau 2010

Table 3.4-5
Project Area and Citywide Trends in Racial and Ethnic Characteristics

	Non-Caucasian		Hispanic or Latino		Asian	
Geography	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**
Project Area	57%	54%	8%	8%	40%	42%
San Francisco	50%	52%	14%	15%	31%	33%

Source: U.S. Census Bureau 2000, 2010

Households

According to the U.S. Census, the City has an average household size of 2.26 with 44 percent identifying themselves as families. In the proposed project area, more than 50 percent of the households live alone and one-third (34 percent) of households identify themselves as families, as shown in Table 3.4-6. The average household size in the proposed project area is 1.7 persons per household, which is smaller than the citywide average of 2.2 persons per household.

Table 3.4-6
Project Area and Citywide Household Composition in 2010

Census Tract	Total	Average Size	Family Households			
			All	Married Couple	Female Head	Household Living Alone
105	1,682	1.58	32%	29%	2%	58%
117	1,012	1.58	29%	22%	4%	62%
178.01	2,198	1.46	29%	25%	3%	62%
180	1,499	1.63	27%	23%	2%	52%
226	815	1.83	33%	29%	2%	39%
227.02	981	2.05	39%	32%	4%	34%
607	4,381	1.83	38%	31%	5%	43%
611	2,135	2.01	53%	41%	8%	45%
615	6,785	1.61	29%	25%	3%	52%
Project Area	**21,488**	**1.71**	**34%**	**28%**	**4%**	**50%**
San Francisco	345,811	2.26	44%	32%	8%	39%

Source: U.S. Census Bureau 2010

Poverty Status and Median Income

The U.S. Census Bureau uses the federal government's official poverty threshold definition, which is based on income, family size, and age. The nationwide poverty definition is adjusted annually to reflect changes in the Consumer Price Index, but it is not adjusted for regional variations in cost of living. The Bay Area has one of the highest costs of living in the United States, and thus households living below the poverty level in the proposed project are likely have greater difficulty affording basic necessities compared to the U.S. as a whole.

In 2012, the nationwide poverty threshold for a two person family was $15,130. Based on the 2012 American Community Survey estimates (U.S. Census Bureau 2012), the percentage of households living below the poverty level in the City is 13 percent, which increased from 11 percent in 2000. Three census tracts in the proposed project area currently have a higher percentage of households living below the poverty line compared to the citywide average. Although the percentage of project area households below the poverty line continues to be higher than the City's, it has decreased from 18 percent in 2000 to 15 percent, according to the 2012 American Community Survey (see Table 3.4-7 and Table 3.4-8).

Transit Dependent Populations

Data from the 2008–2012 American Community Survey estimates (U.S. Census Bureau 2012) were used to identify transit dependent populations. Transit dependent populations typically include households with people with disabilities, children, and the elderly, and households without a vehicle. The following discussion compares these populations in the project study area against the citywide population of these groups.

Table 3.4-7
Project Area and Citywide Poverty Status and Median Income in 2010

Census Tract	Poverty Status	Median Household Income
105	7%	$115,574
117	39%	$30,455
178.01	39%	$16,190
180	3%	$126,389
226	3%	$129,122
227.02	5%	$140,000
607	10%	$101,322
611	38%	$14,484
615	6%	$117,824
Project Area	**15%**	**$14,484 to $140,000**
San Francisco	13%	$73,802
Source: U.S. Census Bureau 2012		

Table 3.4-8
Project Area and Citywide Trends in Poverty Status and Median Income

	2000 Poverty Status	2010 Poverty Status
Project Area	18%	15%
San Francisco	11%	13%
Source: U.S. Census Bureau 2012		

Households with People with Disabilities

A disability is considered a long-term condition that includes sensory (vision or hearing), physical (difficulty walking or climbing stairs), or mental (cognitive tasks such as learning, remembering or concentrating) challenges. The percentage of households with at least one person with a disability is similar between the proposed project area and the City, averaging just less than 20 percent. Portions of the project area have higher percentages of households with disabilities; namely, census tracts 117 (32 percent), 178.01 (55 percent) and 611 (40 percent), as shown in Table 3.4-9.

Households without Vehicles

The percentage of households in the project area without a vehicle ranges from 6 to 82 percent, as shown in Table 3.4-9. Over 70 percent of households in three census tracts (117, 178.01, and 611) do not have a vehicle available to them. The overall percentage of project area households without an automobile (40 percent) is greater that the percentage citywide (31 percent).

Children

For the purposes of this analysis, children are considered as individuals between the ages of 0 and 18. Five census tracts have populations of children equal to or greater than 7 percent, which is the overall percentage of children in the project area. Within those census tracts, the populations of children range from 8 percent to a maximum of 12 percent of the total census tract population. Census tracts 227.02 and 611 have 12 percent of their population as children, the highest in the project area. These census tracts are

Table 3.4-9
Existing Transit-Dependent Populations in the Study Area

Census Tract	Disability Status	Households Without Vehicles	Elderly (Age 65+)	Children (Age 0-17)
105	8%	35%	28%	6%
117	32%	73%	14%	3%
178.01	55%	75%	61%	3%
180	7%	30%	4%	5%
226	6%	8%	4%	9%
227.02	11%	6%	8%	13%
607	9%	26%	7%	8%
611	40%	82%	30%	10%
615	8%	30%	6%	8%
Project Area	**18%**	**40%**	**18%**	**7%**
San Francisco	19%	31%	14%	13%

Source: U.S. Census Bureau 2012

located south of 17th Street, between Interstate 280 and U.S. Highway 101, and northwest of Battery Street and Sacramento Street, respectively. Citywide, the percentage of children is 13 percent, meaning that none of the project study area census tracts exceeds the citywide percentage.

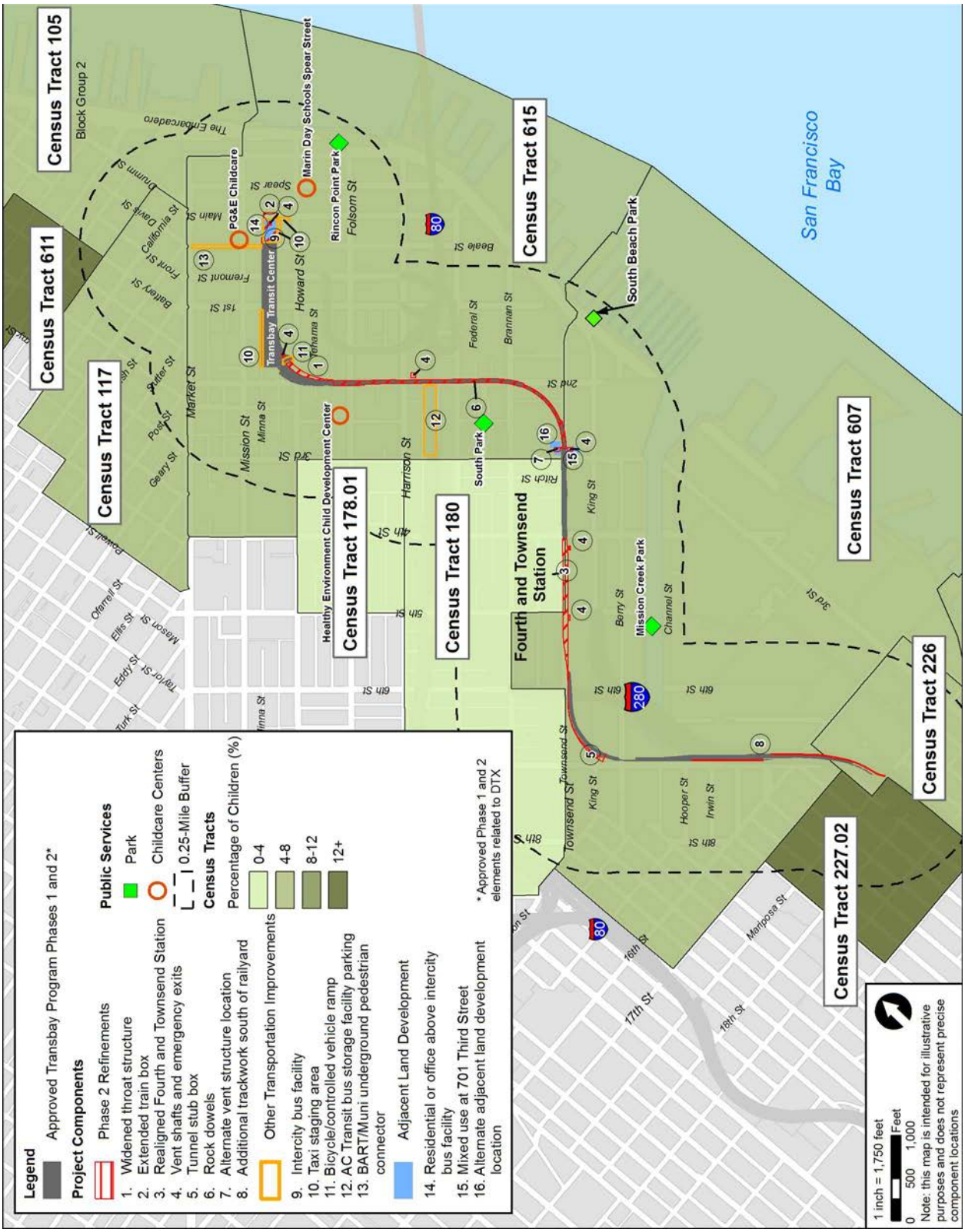
In addition to identifying where children under the age of 18 live, locations where children frequent and/or could have prolonged exposure to environmental and health and safety risks are identified here to address Executive Order 13045. Section 3.15, Public Services, Community Services, and Recreational Facilities, identifies schools, childcare centers, and parks and recreational facilities in the study area. As described in Section 3.15, no public or private schools (grades K–12) are located in the study area (see Figure 3.15-1). However, public parks, public waterfront areas, several public plazas, and childcare centers exist, where children may congregate. These uses in the study area are shown in Figure 3.4-2.

Elderly

For the purposes of this analysis, the elderly are considered as individuals 65 years or older. Three census tracts have a greater percentage of elderly than the project area, which is 18 percent. Census tracts 105, 178.01, and 611 have 28, 61, and 30 percent of the population age 65 or older, respectively. In the project area, the elderly population totals 18 percent); citywide, this population totals 14 percent.

Low English Language Proficiency

Low English-language-proficiency populations are populations who consider their English language proficiency to be less than "very well." Based on the 2008–2012 American Community Survey estimates (U.S. Census Bureau 2012), census tracts 178.1 and 611 have substantially larger percentages of their populations with less than "very well" English language proficiency, compared to the citywide average of 23.3 percent (see Table 3.4-10). Census tract 178.1 has 56 percent of its population with poor English skills; census tract 611 has 76 percent of its population with poor English skills. These communities are afforded special consideration under Executive Order 13166.



Sources: City and County of San Francisco 2013; U.S. Census Bureau 2010; compiled by AECOM in 2014

Figure 3.4-2 Number of Children and Locations where Children Have Prolonged Exposure

Table 3.4-10
Populations with Low English Language Proficiency

Census Tract	Low English Language Proficiency
105	12%
117	23%
178.01	56%
180	14%
226	4%
227.02	6%
607	22%
611	76%
615	14%
Project Area	**25%**
San Francisco	23%
Source: U.S. Census Bureau 2012	

Housing Supply

Multifamily housing accounts for two-thirds of the housing units in the City (City of San Francisco 2011). The proposed project area's housing stock is predominantly multifamily units in large apartment and condominium buildings, representing 95 percent of the units. Despite the strong housing market in the Bay Area, according to the 2012 American Community Survey, the residential vacancy rate in the City is 9 percent. The proposed project area's vacancy rates range from 5 to 27 percent (for an average of 16 percent), as shown in Table 3.4-11.

Table 3.4-11
Project Area and Citywide Housing Stock Inventory in 2012

Census Tract	Single Family	Multifamily	Mobile Homes	Boats, RV, Van, etc.	Total Housing Units	Vacancy Rate (%)
105	102	1,844	0	0	1,946	19%
117	0	1,223	36	0	1,259	27%
178.01	51	2,417	0	0	2,494	23%
180	20	1,515	0	0	1,535	11%
226	156	692	15	4	867	5%
227.02	260	812	0	0	1,072	7%
607	109	4,292	0	0	4,401	7%
611	77	2,280	31	0	2,388	9%
615	274	7,690	29	10	8,003	22%
Project Area	**1,049**	**22,765**	**111**	**14**	**23,965**	**16%**
San Francisco	121,909	253,285	455	202	375,861	9%
Source: U.S. Census Bureau 2012						

Tenure and Housing Affordability

Although the housing stock and occupancy rates vary between the City and the proposed project area, both have a similar ratio of rental and ownership tenure, with approximately one-third of households owning their units and two-thirds renting their housing units.

Housing affordability is measured by comparing what households of different income levels can afford to pay for housing. According to the United States Department of Housing and Urban Development, housing is considered affordable when 30 percent or less of a household's income is spent on housing.[3] Approximately 40 percent of renters in the proposed project area experience a housing cost burden, with 19 percent paying more than 50 percent of their income on rental expenses. The cost burden is higher for homeowners. More than one-half of the owner households in the proposed project area pay more than 30 percent of their income on their mortgages and 22 percent spent more than 50 percent of their income on their mortgages as shown in Table 3.4-12.

Table 3.4-12
Existing Project Area and Citywide Housing Cost as a Percent of Total Income

Geography	Occupied Housing Units	Owner	Cost Burden		Renter	Cost Burden	
			30 to 49.9%	50% or More		30 to 49.9%	50% or More
Project Area	19,879	34%	29%	22%	66%	21%	19%
San Francisco	340,839	37%	26%	23%	63%	22%	22%

Source: U.S. Census Bureau 2012

Population and Employment Trends

According to projections from the Association of Bay Area Governments, the City's population and employment is projected to add approximately 270,000 residents, 101,000 households, and 192,000 jobs from 2010 to 2040, with an average annual growth rate of approximately 1 percent (see Table 3.4-13). It is projected that the proposed project area would add approximately 16,000 residents, 8,000 households and 49,000 jobs for an annual growth rate ranging from 1.6 to 1.9 percent. As shown in Table 3.4-13, the proposed project area is projected to have faster growth rates for population, households, and employed residents, and a similar growth rate for jobs, compared to the City over this time period.

Regulatory Framework

The following discussion summarizes the relevant laws, regulations, and policies concerning socioeconomics, including new guidance issued since the 2004 FEIS/EIR.

[3] The 30 percent standard evolved from a set of rules that were intended to determine how much families in federally assisted housing must pay in rent. In 1968, Congress mandated that no family would pay more than 25 percent of its income in federally assisted housing rent. This limit was increased to 30 percent in 1981. Although this change was designed to reduce the costs of federally assisted housing, it has since been used to measure whether all households would be able to meet their housing needs with 30 percent of their income, and paying a higher percentage would pose difficulties in affording non-residential necessities. The 30 percent standard is used by U.S. Department of Housing and Urban Development in its definition of "affordable" housing.

Table 3.4-13
Sustainable Communities Strategy Projections for San Francisco, 2010 to 2040

	2010	2020	2030	2040	2010-2040 Change	2010-2040 Annual Growth Rate
City of San Francisco						
Population	780,971	863,858	952,755	1,051,051	270,080	1.0%
Households	345,811	379,091	413,169	447,248	101,437	0.9%
Average Household Size	2.3	2.3	2.3	2.4		
Employed Residents	413,729	491,218	519,391	559,753	146,024	1.0%
Jobs	568,724	671,586	708,174	760,227	191,503	1.0%
Project Area						
Population	23,156	27,956	33,282	39,261	16,105	1.8%
Households	13,018	15,569	18,282	21,096	8,078	1.6%
Average Household Size	1.8	1.8	1.8	1.9		
Employed Residents	7,146	9,148	10,561	12,482	5,335	1.9%
Jobs	150,689	177,425	186,481	199,295	48,606	0.9%

Note:
[a] Project area is based on the following Traffic Analysis Zone (TAZ) numbers: 1, 2, 3, 4, 5, 18, 19, 20, 21, 22, 23, 24, 25, 109, 110, 111 and 112. A TAZ is a unit of geography commonly used in transportation planning models.
Source: ABAG and MTC 2012

Federal

Americans with Disabilities Act (42 USC Sections 12101 to 12213)

The Americans with Disabilities Act prohibits discrimination based on disability.

Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 USC Chapter 61)

The federal Relocation Assistance Program ensures that persons displaced as a result of a federal action or by an undertaking involving federal funds are treated fairly, consistently, and equitably. This helps to ensure persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

Executive Order 13045

Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks," requires federal agencies to minimize environmental health and safety risks to children, and to prioritize the identification and assessment of environmental health and safety risks that may have a disproportionate impact on children. This executive order recognizes that some physiological and behavioral traits of children render them more susceptible and vulnerable than adults to environmental health and safety risks.

In 1996, the U.S. Environmental Protection Agency (EPA) developed a National Agenda to ensure that all standards set by the EPA are protective of any heightened risks faced by children, and to develop a scientific research strategy focused on the gaps in knowledge regarding child-specific susceptibility and exposure to environmental pollutants. The EPA has taken steps to fulfill the requirements of the National Agenda and Executive Order 13045 by updating certain air quality standards to provide additional health protection for children and implementing the 1996 Safe Drinking Water Act Amendments.

Executive Order 13166

Executive Order 13166 requires each federal agency to see that recipients of federal financial assistance are provided meaningful access to its programs and activities, including applicants and beneficiaries with limited English proficiency.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on established communities, and to avoid or mitigate those impacts when feasible. Pursuant to CEQA Guidelines Section 15131(b), economic and social impacts of a project that are not related to physical changes in the environment are not treated as significant impacts on the environment, but may be used to evaluate the significance of physical changes that would be caused by a project.

California Relocation and Assistance Act (Government Code Section 7260 et seq.)

In parallel with the similar federal law, this act requires state and local governments to provide relocation assistance and benefits to displaced persons as a result of projects undertaken by state and/or local agencies that do not involve federal funds.

Local

San Francisco General Plan

The proposed project site lies in the jurisdiction of the City and County of San Francisco. State law requires that each local jurisdiction adopt a comprehensive general plan to guide its physical development. The San Francisco General Plan, adopted in 1996, is the official city policy document guiding planned development in its jurisdiction. The Commerce and Industry Element and the Housing Element of the General Plan contain policies and objectives pertaining to employment, population, and housing issues. The Commerce and Industry Element encourages economic development and contains policies to manage economic growth in the City. The Housing Element evaluates housing needs in comparison to land development capacity, and provides policies aimed at improving capacity and fostering affordable housing development.

The San Francisco Sustainability Plan, adopted in 1997 (City of San Francisco 1997), contains policy guidance in 10 specific environmental issue areas and five general areas, including economic development and environmental justice.

San Francisco Administrative Code

Chapter 6.22 and Chapter 83 of the San Francisco Administrative Code address requirements for local hiring for certain activities taking place in the City, including infrastructure improvement projects.

San Francisco Area Plans

Section 3.3, Land Use and Planning, Wind, and Shadow, in the preceding section of this SEIS/EIR, identified the various areas, districts, and neighborhoods that comprise the proposed project area. As described in Section 3.3, a number of different overlapping area plans encompass the proposed project area, and consequently there are many defined districts or neighborhoods. Very broadly, the primary identifiable districts and neighborhoods in the proposed project area are the Transit Center District, surrounding the new Transit Center; the East and Central South of Market Area, between Market and

Townsend Streets and including Yerba Buena Gardens, the Moscone Convention Center and multiple museums, and South Park; and Mission Bay North, between Third and Seventh Streets, from Townsend Street south to Channel Street.

3.4.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The NEPA and CEQA incorporate different provisions affecting identification and mitigation of socioeconomic impacts. As stated above under "Regulatory Framework," NEPA considers the environment in its broadest terms, including both physical and socioeconomic conditions; CEQA focuses on the physical environment but does allow the introduction of social and economic considerations to the extent that they help explain the significance of physical environmental impacts. More specifically, CEQA defines a significant effect on the environment as a substantial or potentially substantial adverse change in the physical conditions in the area affected by the project, and does not include social or economic changes (CEQA Guidelines Section 15382). CEQA does not treat social and economic changes that might result from a project as significant environmental effects in and of themselves, although they may be used to determine the significance of a related physical change in the environment (CEQA Guidelines Sections 15064(e) and 15131). CEQA does, however, require consideration of population and housing impacts, and Appendix G of the CEQA Guidelines includes the first two thresholds of significance presented in the bulleted list below.

Because the 2004 FEIS/EIR determined that no significant socioeconomic impacts would occur, the purpose of this SEIS/EIR is to determine if the socioeconomic characteristics in the study area have changed since approval of the 2004 FEIS/EIR. This current analysis evaluates the additional features of the proposed project to determine if socioeconomic impacts would occur in the proposed project area. In addition, impacts of the project on children were not specifically addressed in the previously certified 2004 FEIS/EIR and are discussed below. The proposed project would have a potentially significant impact related to socioeconomics if it were to do any of the following:

- displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere;
- displace substantial numbers of people, necessitating the construction of replacement housing elsewhere;
- displace substantial numbers of businesses or employees without adequate replacement resources;
- result in changes to City government operations due to substantial alteration of fiscal conditions;
- result in substantial loss of community cohesion, social patterns of interaction, or important social or cultural institutions; or
- result in adverse environmental health and safety risks predominantly borne by a population of children and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the remainder of the population.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the socioeconomics effects will be the same as those presented in Section 5.3 Socioeconomics (pages 5-35 to 5-37) of the 2004 FEIS/EIR and the subsequent addenda. The 2004 FEIS/EIR and subsequent addenda concluded that the Transbay Program will have no effect/no impact on socioeconomics with implementation of Mitigation Measure Prop 1. A summary of those previously analyzed effects and of previously adopted Mitigation Measure Prop 1 is provided below. The full text of the mitigation measure is presented in Appendix C of this SEIS/EIR.

Land Acquisition, Displacement, and Relocation. Construction of the Downtown Rail Extension (DTX) will involve acquisitions and displacements, primarily where the alignment will curve north from Townsend Street to Second Street and where the alignment will curve east from Second Street toward the Transit Center via Howard Street. The DTX was estimated to require displacement of 23 residential units, affecting approximately 46 residents, and 40 businesses, affecting approximately 425 employees. Table 3.4-14 shows the types of businesses affected by the DTX. In addition, the DTX will require underground easements, concentrated along Townsend and Brannan Streets and the 600 block of Second Street, and a temporary construction easement across the south side of 201 Mission Street. Mitigation Measure Prop 1 was identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program to reduce relocation impacts.

- **Prop 1 –** to mitigate for land acquisition and displacement, all homeowners, renters, and businesses shall be offered relocation assistance in accordance with state and federal laws.

Fiscal Implications of DTX Land Acquisition. The net acquisition costs for the DTX were identified in Table 5.6-2 of the 2004 FEIS/EIR. In 2001 dollars, acquisition costs (for fee and easements) were $48.2 million; relocation costs, $2.4 million; demolition costs, $1.1 million. These costs will be partially offset by the proceeds from the resale of land after construction is completed. With projected resale proceeds of $7.6 million, the total net acquisition costs amounted to $44.1 million. The fiscal effect of removing properties that generate property tax, sales tax, payroll tax, parking tax, and other revenues was anticipated to be short-term, lasting only for the duration of the construction period and any subsequent period required for property resale. Based on the land acquisition summarized above, the 2004 FEIS/EIR estimated a reduction in annual revenues of approximately $0.9 million, mostly in property tax and payroll tax losses. However, upon resale, it is expected that the short-term tax losses will be recouped.

Economic Vitality. Construction under the No Action Alternative will increase pedestrian activity and potentially contribute to the intensification of land uses and the redevelopment of underutilized parcels in the vicinity of the Transit Center, which will improve the economic vitality of the area. The DTX will improve access to the major employment centers in the heart of downtown San Francisco, and, therefore, will enhance economic activity in this area.

Socioeconomic Environment. The No Action Alternative is expected to intensify the urban character of the area and result in a more cohesive neighborhood with a balanced mixture of residential and commercial uses. The No Action Alternative will not disrupt or adversely affect the existing socioeconomic environment.

Table 3.4-14
Estimated Residential and Non-Residential Acquisitions for Transbay Program

Residences

Project/Component Alternatives	No. of Properties Acquired	Total Est. Land Area in Sq. Ft.	Total Est. Building Sq. Ft.	Estimated Number of Residential Units Displaced by Type					Estimated Persons Displaced
				Total Single Family Units	Mobile Homes	Multi Family		Total	
						Buildings	Units		
Transbay Terminal and Redevelopment Area	No Residential Units Affected								
Caltrain Downtown Extension	2	14,000	50,000	0	0	2	23	23	46

Businesses

Project/ Component Alternatives	No. of Properties Acquired	Total Est. Land Area in Sq. Ft.	Total Est. Building Sq. Ft.	Estimated Number of Businesses Displaced by Type							Estimated Persons Displaced
				Retail	Office/ Bus. Services	Rest./ Bar	Industrial	Ware-house	Parking	Total	
Transbay Terminal and Redevelopment Area	6	36,000	82,000	0	9	0	0	0	1	10	200
Caltrain Downtown Extension	16	81,000	146,000	5	29	4	0	0	2	40	425

Sources: Compiled by Seifel Consulting in 2014; adapted by AECOM in 2014

Construction. The 2004 FEIS/EIR did not specifically evaluate the socioeconomic effects of the Transbay Program during the construction period. However, aspects of community character, cohesion, economic vitality, and access to community facilities—all of which collectively help to define an area's socioeconomic environment—were addressed. No important or community or social institutions were identified for land acquisition. Because of the extensive construction involving cut-and-cover techniques, loss of access for businesses, disruption of travel ways, noise, and air emissions were all significant effects requiring mitigation. The combination of these temporary effects will adversely affect community character, interfere with community cohesion, and be disruptive to the business community.

To mitigate these effects, the 2004 FEIS/EIR identified construction-period mitigation measures for visual/aesthetics, noise, vibration, air emissions, and public and community services, summaries of which are included in each of these topics within this chapter of the SEIS/EIR (see Section 3.5, Aesthetics; Section 3.12, Noise and Vibration; Section 3.13, Air Quality; and Section 3.15, Public Services, Community Services, and Recreational Facilities). Of particular note, Mitigation Measures PC 2, PC 4, PC 5, PC 6, PC 7, GC 1, and GC 2 were adopted and included in the Transbay Program. A summary of these measures is provided below, and the full description of the mitigation measures is contained in Appendix C of this SEIS/EIR.

- **PC 2** – interview businesses along the alignment to assist in (a) the identification of possible techniques during construction to maintain critical business activities, (b) analyze alternative access routes for customers and deliveries to businesses, (c) develop traffic control and detour plans, and (d) finalize construction practices.

- **PC 4** – establish community construction information/outreach program to provide on-going dialogue construction impacts and possible mitigation/solutions.

- **PC 5** – establish site and field offices located along the alignment to better understand community/business needs during the construction period; manage construction-related matters pertaining to the public; and notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks).

- **PC 6** – implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction, and to provide information on the project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information.

- **PC 7** – develop traffic management plans to maintain access to all businesses. Perform daily cleaning of work areas for the duration of the construction period. Include provisions in construction contracts to require maintenance of driveway access to businesses to the extent feasible.

- **GC 1** – disseminate information to the community in a timely manner regarding anticipated construction activities.

- **GC 2** – provide signage and work with establishments affected by construction activities to develop appropriate signage for alternate routes.

With the adoption of these measures, in combination with the temporary nature of construction impacts, the Transbay Program did not report an adverse effect socioeconomic effect during the construction period.

Children. The 2004 FEIS/EIR did not identify disproportionate impacts on children. Based on the summary of populations of children shown in Table 3.4-3, the population of children within the previously approved 2004 FEIS/EIR project area and the proximity to spaces where children frequent and/or have prolonged exposure are likely to be similar to that presented for the proposed project area, and therefore will experience similar impacts. The No Action Alternative analysis in Section 3.2, Transportation; Section 3.8, Water Resources and Water Quality; Section 3.10, Hazardous Materials; Section 3.12, Noise and Vibration; Section 3.13, Air Quality; and Section 3.16, Safety and Security of this SEIS/EIR discuss potential impacts from the Transbay Program. None of those impacts would be disproportionately borne by children. Moreover, mitigation measures previously identified in the 2004 FEIS/EIR and adopted and incorporated into the approved Transbay Program will reduce potential impacts on health and safety for all populations, including children (the full description of the mitigation measures is contained in Appendix C of this SEIS/EIR). Therefore, the No Action Alternative would be consistent with Executive Order 13045.

Proposed Project

Impact SE-1: The proposed project would not displace homes or residents. Although the proposed project would result in relocation of businesses, there are adequate replacement resources in the proposed project area. (No Adverse Effect/Less-than-Significant Impact)

Seven of the proposed project components—realigned Fourth and Townsend Street Station, tunnel stub box, additional trackwork south of the Caltrain railyard, taxi staging area, bicycle/controlled vehicle ramp, AC Transit bus storage facility parking, and underground pedestrian connector—would not require

property acquisition; therefore, they would have no impact due to displacement of residential units or businesses. More specifically:

- The realigned Fourth and Townsend Street Station would be shifted to be aligned within the Townsend Street public right-of-way, and station facilities such as entrances and vent structures would not require the acquisition of property.

- The tunnel stub box would be an underground facility beneath the Caltrain railyard. Its construction would not require acquisition of properties.

- The additional trackwork south of the Caltrain railyard would occur within the existing Caltrain right-of-way and would not require the acquisition of property.

- The taxi staging area would involve use of street space for pick-up and drop-off of passengers at the Transit Center. This use would not require property acquisition, as taxis would queue in the streets along the curbsides.

- The bicycle/controlled vehicle ramp would be integrated into the Transit Center. It is proposed to be located on land currently owned by the TJPA and used for staging and access for Phase 1 construction.

- The AC Transit bus storage facility was approved as part of the 2004 FEIS/EIR. The proposed project would use this facility for parking in the evening when bus storage is not required and would not require any property acquisition.

- The underground pedestrian connector would be located beneath Beale Street. The connector and emergency exits would be within the public right-of-way and would not require any property acquisition.

Because none of these proposed project components would involve additional land acquisition or displacement, and would be either below ground or expansions of existing uses, they would not adversely affect community character or the economic vitality of the proposed project area. The Fourth and Townsend Street Station would be an important infrastructure addition that could act as a catalyst, along with the Central Subway, to more intensive development in the Central SoMa area; however, this station was already approved as part of the Transbay Program and the proposed change under the proposed project is its realignment, which in part would support future City plans for development at and around the Caltrain railyard.

The remaining proposed project components (i.e., widened throat structure, extended train box, the vent structure at Third and Townsend Streets, the vent structure at Second and Harrison Streets, the installation of rock dowels, and the intercity bus facility) could require property acquisition, result in business displacement, or affect the socioeconomics of the project area. As a result, the following analysis focuses on these proposed project components.

Land Acquisition. The proposed project would potentially affect the parcels shown in Table 3.4-15. Full acquisition of one or two private parcels would be required for the vent structure at Third and Townsend Streets, depending on which optional site is used; partial acquisitions would be required at three additional private parcels; and underground easements may be needed where rock dowels for the mined tunnel construction may extend under private properties. The implications of this land acquisition in terms of displacement and relocation effects are addressed below.

Business and Employment Displacement. The business and employment displacement resulting from construction of the proposed project is shown in Table 3.4-16, by proposed project component. The five or seven affected parcels (depending on the selected site for the vent structure at Third and Townsend Streets) contain an estimated 11 to 12 businesses, mostly office uses, and employ approximately 1,000 employees. Land acquisition for the proposed project would not involve any residential units.

In total, 114 jobs would be temporarily displaced during construction: 62 employees at 589 Howard Street, and 52 employees from the portion of 235 Second Street that would be affected. It is possible that many of the employees at 235 Second Street could be relocated within the same building.

Table 3.4-15
Land Acquisition under the Proposed Project

Proposed Project Component	Street Address	Assessor Parcel Number	Acquisition Requirements
Widened Throat Structure	235 Second St.	3736/123	Temporary construction easement, followed by permanent underground easement
Widened Throat Structure	589 Howard St.	3736/098	Temporary construction easement, followed by permanent underground easement
Extended Train Box/Intercity Bus Facility	201 Mission St.	3718/026	Partial acquisition
Extended Train Box/Intercity Bus Facility	Parcel N, Parcel N'-175 Beale St.; Parcel M-200 Howard St.	Parcels N and N' (3718/025); Parcel M (3718/027)	Parcels owed by TJPA
Vent Structure at 701 Third St.	701 Third St.	3794/006	Full acquisition
Alternate Vent Structure at northeast corner of Third and Townsend Street	699 Third St., 180 Townsend St.	3788/014; 3788/013	Full acquisition
Vent Structure Second St. and Harrison St.	Southeast corner of Second and Harrison St.	State owned: Parcel Q (3764/068)	Will be transferred to the City who will give a portion to TJPA
Rock Dowels	Along Second St. where mined tunnel is proposed	Potentially multiple	Possible underground easements if rock dowels encroach under private properties

Source: City and County of San Francisco 2014a

Table 3.4-16
Employment Effects of Proposed Project Components

Component	Address and APN	No. of Properties Acquired	Land Area	Building Square Footage[a]	Businesses Displaced by Type				Estimated Employees Displaced/ Temporarily Relocated[b]
					Office/ Business Services	Restaurant/ Retail	Parking	Total	
Widened Throat Structure with Vent Structure	589 Howard St. (3736/098)	1	2,550	15,600	5	0	0	5	62
	235 Second St. (3736/123)	1	2,177	13,065	1	0	0	1	52
	Subtotal	2	4,727	28,665	6	0	0	6	114
Extended Train Box/Intercity Bus Facility	201 Mission St. (3718/026)	1	69,268	10,266	5	0	48 spaces	5	41
Vent Structure	701 Third St. (3794/006)	1	13,750	1,716	0	1	0	1	50

Table 3.4-16
Employment Effects of Proposed Project Components

Component	Address and APN	No. of Properties Acquired	Land Area	Building Square Footage[a]	Businesses Displaced by Type				Estimated Employees Displaced/ Temporarily Relocated[b]
					Office/ Business Services	Restaurant/ Retail	Parking	Total	
Alternate Vent Structure location	699 Third St. and 180 Townsend St. (3788/013; 3788/014)	2	16,000	47,375	1	1	0	2	151
Vent Structure	Second and Harrison (3764/068)	1	13,750	Parking Lot	0	0	1 lot (65 spaces)	1	10
Total		**5-7**	**101,495-103,745**	**40,647-86,306**	**11-12**	**1**	**1**	**13-14**	**114/ 101-202**

Notes:

[a] The number of employees displaced is based on estimates of the building square footage that would be affected. Thus, the affected building area and the estimate of employees displaced or temporarily relocated from 201 Mission and 235 Mission do not reflect the full building floor area or total employment.

[b] The parcels affected for the widened throat structure would be needed during the construction period, so that the employee effects are expected to be temporary relocation. All other parcels would be needed for the proposed project facilities and operations long term, and the related employment effects would be displacement. This table does not include the employees of 171 Second Street that were projected to be displaced in the 2004 FEIS/EIR, but now would be able remain in their building. An estimated 78 jobs would be preserved. Table IV-1 from the Downtown San Francisco: Market Demand, Growth Projections and Capacity Analysis assumes 300 square feet per worker with 8 percent vacancy, or approximately 276 square feet per worker. According to the CoreNet Global Corporate Real Estate 2020 survey, average square feet per office worker is trending downward. The 250-square-foot assumption reflects this trend. Retail employment is assumed at 1 worker per 450 square feet and is based on the Association of Bay Area Government's 1987 Input Output Model.

Sources: ABAG 1991; NAIOP 2012; McDonald's Corporation 2013; National Parking Association 2011; compiled by Seifel Consulting in 2014; adapted by AECOM in 2014

Employees would be permanently displaced from a portion of the building at 201 Mission Street, the vent structure site at Second and Harrison Streets, and the vent structure site at Third and Townsend Streets. The total displacement would be between 101 and 202 employees, depending on which vent structure site at Third and Townsend Streets is used. This loss of jobs would be partially offset by the preservation of the building at 165-173 Second Street (current address: 171 Second Street). This building was proposed for demolition in the 2004 FEIS/EIR; however, under the proposed project, the widened throat structure would be shifted to the east from the previously approved alignment and would no longer require acquisition and demolition of the building at 171 Second Street. This six-story building houses an estimated 78 employees, and its preservation would substantially reduce the permanent jobs loss estimated for the proposed project.

With future adjacent land development at the intercity bus facility and the vent structure site at Third and Townsend Streets, new jobs could more than offset this estimate of jobs loss. Table 3.4-17 summarizes the net employment impacts. There could be a potential net gain of 464 jobs, assuming commercial development at sites where non-residential uses are permitted. On the other hand, if residential uses were developed instead, where this option exists, then the net effect would be no loss of jobs. As shown in Tables 3.4-16 and 3.4-17, the following proposed project components would result in business and employment effects: widened throat structure, extended train box and intercity bus facility, vent structure and adjacent development location at Third and Townsend Streets, and the AC Transit bus storage facility parking. The effects of each component are described below.

Widened Throat Structure. The proposed widened throat structure would be shifted east and would occupy a larger footprint than was previously evaluated in the 2004 FEIS/EIR. As a result, two additional properties, beyond those identified in the 2004 FEIS/EIR, would be affected: 589 Howard Street and 235

Table 3.4-17
Potential Permanent Job Impacts by Proposed Project Components

Component	Address and APN	Jobs Displaced		Jobs Gained		Maximum Net Number of Jobs (assuming adjacent land development is commercial)[b]	Minimum Net Number of Jobs (assuming adjacent land development is commercial)[b]
		Building Square Footage	Total Jobs[a]	Building Square Footage	Max Jobs with Commercial Adjacent Land Development[a]		
Widened Throat Structure with Vent Structure	589 Howard St. (3736/089) 235 Second St. (3736/123)[c] 165-173 Second St. (3721/025)	15,600 13,065 0	0 0 0	15,600 13,065 25,120	0 0 78	0 0 78	0 0 78
	Subtotal	28,665	0	28,665	78	78	78
Extended Train Box/Intercity Bus Facility	201 Mission St. (3718/026)	10,266	41	45,000	180	139	-41
Vent Structure	701 Third St. (3794/006)[d]	1,716	50	76,500	297	247	-50
Alternate Vent Structure location	699 Third St. and 180 Townsend St. (3788/013; 3788/014)	47,375	151	72,000	267	116	9
Vent Structure	Second and Harrison (3764/068)[e]	Parking Lo	10			-10	-10
AC Transit Bus Storage Parking[f]					10	10	10
	Total		**101-202**		**535-565**	**333-464**	**-13 - +46**

Notes:

[a] Table IV-1 from the Downtown San Francisco: Market Demand, Growth Projections and Capacity Analysis assumes 300 square feet per worker with 8 percent vacancy, or approximately 276 square feet per worker. According to the CoreNet Global Corporate Real Estate 2020 survey, average square feet per office worker is trending downward. The 250-square-foot assumption reflects this trend. Retail employment is assumed at 1 worker per 450 square feet and is based on the Association of Bay Area Government's 1987 Input Output Model.

[b] Maximum Net Number of Jobs assumes ground floor retail with offices above at 701 Third Street and office uses at the intercity bus facility on top of the extended train box. Minimum Net Number of Jobs assumes residential development at these two parcels. For the alternate vent structure site at Third and Townsend Streets, the maximum number of jobs assumes more intense commercial uses, consistent with the existing SLI zoning. The minimum number of jobs also would be consistent with current zoning, but assumes less intensive service commercial/industrial uses.

[c] Employment for 235 Second Street is based on the portion of the building that would be affected. TJPA may temporarily relocate the employees until construction is done.

[d] Based on 1.8 million employees in 34,000 restaurants according to McDonald's corporate website, approximately 50 employees per establishment. The parcel is zoned as Mixed Use and could accommodate another fast food restaurant, office space, housing, or a mix of uses, based on zoning. The parcel has a height limit of 105-F. Jobs gained assumptions are based on ground floor retail with office above.

[e] According to the National Parking Association, The Size and Scope of Parking in America, dated May 2011, there were approximately 13,010 commercial owner/operator facilities with 125,630 employees, for an average of 9.65.

[f] The AC Transit Bus Storage Parking facility is proposed to be operated during special events and at night-time.

Sources: CoreNet Global 2012; ABAG 1991; NAIOP 2012; McDonald's Corporation 2013; National Parking Association 2011; compiled by Seifel Consulting in 2014; adapted by AECOM in 2014

Second Street. The cut-and-cover construction and the future train box would pass under portions of both buildings. For safety reasons and as a result of impaired access during construction of the throat structure, the building located at 589 Howard Street would likely be vacated during the construction period, which is anticipated to last approximately 2.5 years.

The 589 Howard Street property is 2,550 square feet, and has a five-story, 15,600-square-foot office building that was constructed in 1907. The building also has a one-story basement. The TJPA evaluated two options for construction underneath this building: demolishing the basement and supporting, or underpinning, the rest of the building, or permanently demolishing the basement, temporarily demolishing the northwest corner of the building, and then restoring the building following construction of the throat structure. Because this property is a historic resource, the former approach was accepted by the TJPA for the proposed project. During construction, building occupants would be temporarily relocated. Based on a field survey, this proposed project component would displace five business tenants, and, based on industry standards of 1 employee per 250 square feet, 62 employees for 2.5 years.

The 235 Second Street property is a 300,000-square-foot, six-story office building with a one-story basement. CBS has a 15-year lease on the building. The TJPA is anticipating that the front (west façade) of the building would be demolished and reconstructed following construction of the throat structure. Of an estimated 800 employees, 52 would be displaced. The TJPA would temporarily relocate these employees during construction, either within the building or off-site.

The shift of the widened throat structure would have the beneficial effect of preserving a historic building at 171 Second Street that was identified for demolition in the 2004 FEIS/EIR. Like 589 Howard Street, the throat structure would pass under the building, but it could be preserved in place by underpinning the building. This six-story, 25,120-square-foot office/retail building is estimated to have 78 employees that would not be permanently displaced.

In summary, the widened throat structure would affect approximately 114 jobs. In the event that the displaced businesses choose not to relocate within the area, a loss of jobs would result. However, the TJPA proposes to temporarily relocate these employees. This proposal, plus the jobs that would be retained by preserving the office/retail uses at 171 Second Street, would result in a net job gain attributable to the proposed project.

Extended Train Box and Intercity Bus Facility. The extended train box would require demolition of above- and below-grade facilities at 201 Mission Street. The partial demolition would affect 10,266 square feet of office uses, which is estimated to house 41 employees. This space is located on three different floors in the podium area at the back (south side) of the building. The affected area would also involve displacement of a cogeneration facility, waste area, delivery access, and a portion of the surface parking lot under the podium south to Howard Street. The portion of the surface parking lot affected by these proposed project components would displace an estimated 48 parking spaces.

Above the extended train box, the TJPA proposes an intercity bus facility to accommodate regional and long-haul bus operators, such as Greyhound and Amtrak. Approximately 45,000 square feet of office or residential development could be developed by others above the intercity bus facility. If developed as office, 180 jobs could be created. The net job impact would range from a loss of 41 jobs if the space above the intercity bus facility is developed with residential uses, to a net gain of 139 jobs if the space above the intercity bus facility is developed with offices.

Vent Structure at Third and Townsend Streets. The vent structure at 701 Third Street would replace an existing fast food restaurant. Based on the average employment for fast food franchises, 50 employees would be displaced for construction of the vent structure and construction staging. In the event that the displaced businesses choose not to relocate within the area, a loss of jobs would result.

The property at 701 Third Street is zoned for mixed use and could accommodate another fast-food restaurant, office space, housing, or a mix of uses on the portion of the property not used for the vent structure. The developable area at this property after development of the vent structure and emergency

exit is 10,130 square feet with a floor area ratio of 7.5. Assuming ground-floor retail (i.e., restaurant) with offices above, this development program would result in nearly 300 jobs and a net gain of approximately 250 jobs on the site.

The alternate vent structure location at the northeast corner of Third and Townsend Streets would replace the existing three-story, 41,125 square feet of office space and ground-floor retail/show room at 180 Townsend Street and the one-story, 6,250 square feet of retail/liquor store at 699 Third Street. The alternate vent structure would occupy approximately 4,000 square feet and would allow for adjacent development to be constructed on a footprint of 12,000 square feet. A six-story mixed-use structure could accommodate approximately 72,000 square feet and could result in 267 new jobs, assuming the ground floor is used for retail/restaurant and the remaining five floors were office space. The alternate vent structure and six-story development would displace 151 jobs, but the addition of 267 jobs results in a maximum net of 116 jobs. Zoning for this site would also permit less intense service/light-industrial uses. If the 72,000-square-foot space were allocated for these uses instead, the potential number of jobs would be 160, assuming the same 450 square feet per employee as retail uses.

AC Transit Bus Storage Facility. The AC Transit bus storage facility is bounded by Perry, Stillman, Third and Fourth Streets and accessed from Perry Street. Currently, this facility can accommodate up to approximately 49 buses. Under the proposed project, this facility would be used for off-hours/nighttime or event parking (e.g., nighttime sporting or special events) when not in use by AC Transit for regular operations. The use of this site for off-hours/nighttime or event parking would result in a gain of 10 jobs.

Relocation Resources. Acquisition of private properties required for the proposed project would represent a loss of approximately 40,647 to 86,306 square feet of building space, most of which is office space. All businesses would be offered relocation assistance in accordance with state and federal laws (previously adopted Mitigation Measure Prop 1 from the 2004 FEIS/EIR).

Based on the large amount of proposed commercial development and the current market conditions for commercial space in the project area, most businesses should be able to be relocated within the project area. As described earlier under Section 3.4.2, Affected Environment, the project area contains more than half of San Francisco's jobs. The project area is located within the downtown area of San Francisco, which contains more than half of the City's office space and a substantial share of the City's retail space.[4]

The project area continues to experience a transformation as older buildings are being rehabilitated and new buildings are being constructed on previously vacant or underutilized parcels. The land use plans that currently govern development in the project area will facilitate intensified development of office and retail space in the project area.[5] More than 6 million square feet of new commercial space is planned for the Transit Center District area alone, which is where all but one of the potentially displaced businesses under the proposed project are located.

The San Francisco economy is booming, greatly benefiting from the robust growth in Bay Area technology and social media companies and the highly educated and qualified workforce that the City has attracted. San Francisco County's unemployment rate has fallen to 5.2 percent, significantly lower than the 2013 national average of 7.0 percent, and since 2008 the City has added approximately 64,000 jobs.

[4] The project area is located within downtown San Francisco, which includes approximately 72 million square feet of office space and 8 million square feet of retail space, representing 64 percent of the City's office space and 16 percent of the City's retail space according to the San Francisco Downtown Plan Annual Monitoring Report (City of San Francisco 2013).

[5] As described in Section 3.3, Land Use and Planning, Wind, and Shadow, future development in this area is guided by a number of adopted plans (Transit Center District Plan, Central SoMa Area Plan, Eastern SoMa Area Plan, and Mission Bay North Plan) that call for intensified development in the vicinity of the proposed project components. In addition, the proposed Central SoMa Plan would facilitate intensified development of properties located between Second Street and Fourth Street.

This has tightened demand for office and retail space in the City and the project area. The fourth quarter of 2013 has been one of the strongest and most active office markets that the City has seen in recent years. As a result, office vacancy rates have decreased to approximately 11 percent as of the end of 2013, and office rents currently range between $50 to $60 per square foot for Class B and Class A office space, respectively (Jones Lang LaSalle 2014). Retail vacancy rates have continued to decline and are currently at approximately 3 percent citywide with rental rates at about $30 per square foot (CoStarGroup 2013).

San Francisco's office market is anticipated to further strengthen in the near future, as technology-related tenants continue to lease significant amounts of space, especially tenants committed to future expansions and those relocating from other markets. A large amount of new office and retail space is projected to come on line within the project area over the next few years, which will provide potential relocation resources. Projects involving approximately 7 million square feet of commercial development are planned or currently have applications pending within a 0.75-mile walking distance of the Transit Center (TJPA 2013). Therefore, displaced businesses interested in relocating within the project area would likely find an ample supply of comparable office and retail space, although relocation rents could be higher.

Impact SE-2: The proposed project would not result in changes to City government operation due to substantial alteration of fiscal conditions. (No Effect/No Impact)

Fiscal effects consider the erosion of current revenues and new development that could result in an expansion of revenue. The proposed project would result in the construction of new facilities that refine Phase 2 of the Transbay Program, enhance the transportation network in the proposed project area, and result in new land development co-located with some of the transportation facilities. The widened throat structure, realigned Fourth and Townsend Street Station and related vent structures, and the vent structures at the Transit Center are proposed to improve operational aspects of DTX and future high-speed train service within the overall footprint of the Transbay Program and/or within public right-of-way. Therefore, the fiscal effects for these components are not discussed further, since they would not involve acquisition of private property that could have fiscal effects.

The extended train box/intercity bus facility and vent structure at Third and Townsend Streets are also proposed for additional land development because they can be more intensively developed per the City's development regulations. This adjacent land development would increase the users on the sites and, as a result, contribute to the intensification of land uses and add to the economic vitality of the area.

As shown in Table 3.4-15, construction of the proposed project components would require full acquisition of one or two private parcels (depending on which vent structure site is selected at Third and Townsend Streets), and partial acquisition and easements on three other private parcels. No residential units would be displaced; however, commercial/office uses would be displaced during construction. As a result of the acquisitions shown in Table 3.4-15, 114 employees are expected to be temporarily relocated during construction, and 101 to 202 jobs would be permanently displaced. Displacement of these businesses would result in reduced property tax revenue, payroll tax revenue, and sales tax revenue to a limited extent. However, this condition is anticipated to be temporary. Moreover, tax revenues that had been assumed in the 2004 FEIS/EIR to be lost with demolition of the office/retail space at 171 Second Street would be retained under the proposed project. As stated in Impact SE-1, San Francisco's office market is anticipated to continue to strengthen in the near future. A large amount of new office and retail space is projected to be available on the market within the project area, over the next few years, which would provide significant relocation opportunities for those businesses either permanently or temporarily displaced to find other space. Therefore, the fiscal effect would be short term and, in the long run, the strong market conditions may result in even greater revenues.

Impact SE-3: The proposed project would not result in substantial loss of community cohesion, social patterns of interaction, or important social or cultural institutions. (No Effect/No Impact)

Community cohesion generally takes into account access and linkages, community facilities (e.g., parks, churches, and schools), and local businesses that provide opportunities for residents to gather and interact. The proposed project would result in the construction of new facilities that refine Phase 2 of the Transbay Program, enhance local transportation connections, and new land development co-located with some of the transportation facilities. The widened throat structure, the extended train box, realigned Fourth and Townsend Street Station, Transit Center vent structures, the tunnel stub box, rock dowels, additional trackwork south of the Caltrain railyard, the taxi staging area, and the bicycle/controlled vehicle ramp would be within the footprint of the Transbay Program, underground, and/or within public right-of-way, and would not block or impede access to or within the project area. Therefore, these components would not detract or reduce community cohesion.

Intercity Bus Facility. The proposed intercity bus facility would be located in an area largely characterized by office uses. The vent structure site at Third and Townsend Street would be located in an area with a mixed of land uses, including residential development. There are two privately owned public open spaces (201 Mission Street and 135 Main Street) in the vicinity of the proposed intercity bus facility site and one private (303 Second Street) and two public (South Park and South Beach Park) open spaces within two blocks of the vent structure at Third and Townsend Streets. There are no other community facilities such as churches or schools in the immediate vicinity of these proposed project sites.

There is a current lack of an active residential community in these areas because the majority of uses are related to businesses and community cohesion is limited. The proposed intercity bus facility and adjacent future development could improve community cohesion by attracting residential development. The new development would increase the density of development, pedestrian traffic, and use in the area, especially during non-business hours. The proposed intercity bus facility would also improve pedestrian access and flow in the area by using the currently undeveloped (parking and construction staging) area to permit circulation in conjunction with use of the Transit Center. This proposed project component would not adversely affect community cohesion or interactions; however, in the future, there is the potential for development to contribute to a sense of community in the emerging neighbourhood envisioned by the Transit Center District Plan.

Vent Structure at Third and Townsend Streets. The vent structure site at Third and Townsend Streets and adjacent land development is within walking distance of AT&T Park and the intersection of the future sites of the Central Subway and DTX, which have been and will be catalysts for the new development envisioned by the Central SoMa Plan. In the southern part of the Central SoMa area where the proposed project component site is located, the City is proposing to retain the service/light-industrial jobs. Therefore, the vent structure and adjacent land development would support the desired community character that would emphasize live/work space, loft space, small professional offices, and production/ distribution/repair businesses.

The proposed project components at these sites would not disrupt or divide the physical arrangement of a community, displace neighborhood facilities, or block access. The adjacent future development of these sites would be beneficial because they would be in accordance with applicable land use plans that aim to intensify the urban character of the area with residential and commercial uses.

Impact SE-4: The proposed project would not result in adverse impacts on transit dependent populations, including people with disabilities, children, the elderly, and households without a vehicle, or on low English language proficiency populations. (Beneficial Effect/No Impact)

The proposed project includes components to make transit more accessible to the transit users in the study area. Project components such as the bicycle parking facility, the underground pedestrian connector, taxi staging area, and intercity bus facility would increase the accessibility to mass transit for those populations that are transit dependent. All project components would be required to comply with the American with Disabilities Act, which would ensure accessibility to people with disabilities. Elderly people and youth who have limited mobility would benefit from the proposed project by having a continuous connection between the Caltrain terminus and downtown San Francisco by way of the DTX and through improved connections to other bus and rail transit services. More convenient travel to other destinations in the State would also become possible with future HSR service that would be made possible by the proposed project. The taxi staging area and bicycle parking facility would benefit households without vehicles by increasing transit options and making it easier to travel within the City without a personal vehicle.

The low English language proficiency (LEP) population would not be affected by the proposed project to a greater degree than populations that are more proficient in the English language. The proposed project would not change any existing conditions for the LEP population and therefore would have no long-term impacts. There may be temporary construction impacts to this population due to temporary detours or street closures; however, Mitigation Measure PC 6 would require an information phone line that would be available in languages other than English. As a result, the LEP population would not be affected to a greater degree than any other population. While there would be impacts to the LEP population during construction, it would be temporary in nature and therefore not an adverse impact.

Impact SE-5: The proposed project would not disproportionately affect children. (No Adverse Effect with Mitigation)

Executive Order 13045 requires federal agencies to consider the effects of their activities on children. As noted in the Section 3.4.2, Affected Environment, the percentage of children in the project study area is less than the citywide percentage. Therefore, impacts would not be disproportionately borne by children. Nevertheless, there are sites in the project study area that would be frequented by children, and this assessment considers these facilities. Based on the analysis presented in this Chapter 3 of the SEIS/EIR, no adverse effects would occur affecting any population, including children, in the study area for the following six resource areas: land use and planning, wind, and shadow; geology, soils, and seismicity; electromagnetic fields; greenhouse gases and climate change; public services, community services, and recreational facilities; and safety and security. Because there would be no adverse effects in these resource areas, children would not be disproportionately affected and these resource areas are not discussed further.

Certain impacts that could affect children include increased traffic, water quality and flood hazard, exposure to hazardous materials, noise and vibration, and air quality. Effects to these resources would not be adverse with mitigation measures identified in this Chapter 3 of the SEIS/EIR. Therefore, there would be no adverse effects predominantly borne by children or suffered by children in a manner that would be appreciably more severe or greater in magnitude than would be experienced by the rest of the population. As a result, the proposed project would be consistent with Executive Order 13045.

Impact C-SE-6: The proposed project would not result in significant temporary socioeconomic impacts associated with construction of the proposed project. (No Adverse Effect/Less-than-Significant Impact)

Temporary construction impacts related to socioeconomics are typically analyzed in terms of their disrupting access to social services or businesses. Social facilities include religious institutions, medical facilities, schools, and recreational facilities; they represent places where residents seek social services, or gather, interact, and form bonds. The economic vitality of local businesses is largely dependent on convenient access by patrons.

Construction of the proposed project would result in the same temporary effects identified for the No Action Alternative that could adversely affect socioeconomic conditions. These include physical changes to the proposed project area, such as aesthetic, noise and vibration, and air emissions that could detract from community cohesion and use of social institutions and community facilities. The same mitigation measures summarized in these resource topics would reduce these effects (see Section 3.5, Aesthetics; Section 3.12, Noise and Vibration; Section 3.13, Air Quality; and Section 3.15, Public Services, Community Services, and Recreational Facilities). In addition to these physical changes in the area, access to businesses, community facilities, and recreational facilities in the proposed project area would be more difficult and inconvenient. The pre-construction activities mitigation measures (particularly PC 2 and PC 7) and general construction mitigation measures (especially GC 2), which were previously identified in the 2004 FEIS/EIR and were adopted and incorporated into the approved Transbay Program, would apply and would continue to be implemented as part of the proposed project. Finally, public outreach efforts, complaint hotlines, and early dissemination of notifications regarding construction activities are valuable techniques for allaying community concerns and keeping members apprised of construction schedule, activities, and durations. These measures, like the above measures, were adopted and incorporated into the Transbay Program, and would apply to the proposed project (see earlier summarized Mitigation Measures PC 4, PC 5, PC 6, and GC 1).

Because these already approved mitigation measures, plus those identified to lessen the physical effects of construction, would be included as part of the construction phase for the proposed project, construction-related effects would not be adverse and would be less than significant.

Cumulative Analysis

Impact CU-SE-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative socioeconomics impacts. (No Adverse Effect/Less-than-Significant Impact)

The geographic scope of this analysis is defined as the area encompassing the Transbay Program; Transit Center District Plan area; and Central SoMa, Eastern SoMa, and Mission Bay North Plans area, because the cumulative socioeconomic impacts would be mostly evident in the vicinity of the proposed project. Development within this geographic area is governed by City planning efforts that seek to create a new vibrant neighborhood, centered around major transportation investments such as the Transit Center and the Central Subway. Existing strong market conditions and planning strategies to intensify development, increase heights, promote residential growth are propelling a substantial change in the socioeconomic fabric of the area.

In particular, the following development projects involve high-density residential or mixed-use buildings within walking distance of the City's traditional central business district on the north side of Market Street. The introduction of housing would alter the socioeconomic character of the project study area which has historically been jobs oriented, and help to enliven the district. Residential development projects currently proposed, approved, or under construction in the project area that would contribute to

direct population growth include 50 First Street, 706 Mission Street/Mexican Museum Project, 181 Fremont Street, 41 Tehama Street, 57 Tehama Street, 900 Folsom Street, 280 Beale Street, 340 Fremont Street, 201 Folsom Street, 45 Lansing Street, 399 Fremont Street, 425 First Street, 801 Brannan Street, 1 Henry Adams Street, 1301 16th Street, 718 Long Bridge Street, Pier 48, 1000 16th Street, 1006 16th Street, 1200 17th Street, 630 Indiana Street, 800 Indiana Street, and 1395 22nd Street. Combined, these development projects, which are described in detail in Table 3.1-1, would result in approximately 6,562 residential units (City and County of San Francisco 2014b).

Additionally, downtown San Francisco serves as the City's primary job center—home to nearly half of the City's jobs, including three-quarters of its office jobs. The 23 mixed-use buildings located in the project area that are currently proposed, approved, or under construction would create a major intensification of land uses and an extension of the City's traditional downtown and financial district into the South of Market area, and particularly around the new Transit Center. The areas encompassed by the geographic scope of this cumulative analysis are envisioned to not only be the location of the majority of growth in the area, but also the economic hub of downtown San Francisco (City of San Francisco 2012).

The population growth rate within the project area, projected into the year 2040, is higher than the City as a whole. The City is addressing the increase in population, housing, and jobs through infrastructure projects, such as the proposed project and the Central Subway Project, which are designed to accommodate increased demand for public transportation, jobs, and housing.

The cumulative effects of this growth and change in the land use pattern would be more housing, greater economic vitality and opportunities, and, with the addition of proposed open space and public realm improvements, a more vibrant and transit-, pedestrian-, and bicycle-oriented neighborhood in the project area. In addition, growth in the project area would result in increasing property values, growth in the City's tax base, more demand for social services and public infrastructure, and likely increase in the median household incomes for the area. This growth and change in the demographic/socioeconomic profile of the project area is planned for in the Transit Center District Plan; Central SoMa Plan, East SoMa Area Plan, and Mission Bay North Redevelopment Project and thus is reflective of City's desired future for this area of the City. Accordingly, the proposed project in combination with reasonably foreseeable development would not adversely alter the area's employment base, fiscal conditions, economic vitality, or social cohesion.

3.4.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Socioeconomics, Population, Housing (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that although the potential would exist to displace homes, businesses, and result in temporary socioeconomic impacts associated with construction in the project area, no adverse effect would occur from the project with mitigation measures Prop 1, PC 2, PC 4 through 7, GC 1 and GC 2. With implementation of mitigation measures adopted as part of the 2004 FEIS/EIR and incorporated into the Transbay Program, the proposed project analyzed in this SEIS/EIR would not result in an adverse socioeconomics effect.
CEQA Summary	
Impact SE-1: Displacement of Homes and Businesses (Less than Significant)	The 2004 FEIS/EIR concluded that although residents and businesses would be displaced, with implementation of mitigation related to relocation assistance, a less-than-significant displacement impact would occur. The 2004 FEIS/EIS indicated that job loss would be minimal because most affected businesses likely would relocate nearby or elsewhere within the City, and other businesses may relocate or expand in the area because of the general improvement in transportation facilities. The proposed project analyzed in this SEIS/EIR would require additional land acquisition, resulting in increased severity to significant land acquisition and job loss impacts identified in the 2004 FEIS/EIR. With implementation of Mitigation Measure Prop 1 from the 2004 FEIS/EIR, previously adopted and incorporated into the Transbay Program, the impact would be less than significant. Therefore, the proposed project analyzed in this SEIS/EIR would worsen a previously identified impact but would not change the significance conclusion in the 2004 FEIS/EIR. No new mitigation measures would be required.
Impact SE-2: City Government Operations due to Alteration of Fiscal Conditions (No Impact)	The 2004 FEIS/EIR concluded that would be no adverse impacts on fiscal conditions and economic vitality. Fiscal and economic impacts are not considered significant impacts under CEQA unless they cause or can be used to measure the significance of a physical change in the environment. The proposed project would not adversely affect economic conditions in the proposed project area in a manner that could contribute to a significant adverse impact on the physical environment.
Impact SE-3: Social Cohesion (No Impact)	The 2004 FEIS/EIR concluded that the Transbay Program would result in a more cohesive neighborhood and improve the character of the existing socioeconomic environment. Social effects are not considered significant impacts under CEQA unless they contribute to a physical environmental impact. The proposed project would not adversely affect social conditions in the proposed project area in a manner that could contribute to a physical environmental impact.
Impact SE-4: Transit Dependent Populations (No Impact)	Social effects are not considered significant impacts under CEQA unless they contribute to a physical environmental impact. The proposed project would not adversely affect conditions for the transit dependent or LEP populations in the proposed project area in a manner that could contribute to a physical environmental impact.
Impact SE-5: Children (Not Evaluated under CEQA)	No requirement exists to evaluate impacts on children, pursuant to the guidance of Executive Order 13045. Therefore, no CEQA significance conclusion exists specific to this executive order. However, aspects of child safety and health risks are addressed in Section 3.13, Air Quality.
Impact C-SE-6: Construction – Temporary Socioeconomic Impacts (Less than Significant)	The 2004 FEIS/EIR concluded that no socioeconomic impact would result from construction activities. Social impacts are not considered significant impacts under CEQA unless they contribute to a physical environmental impact. The proposed project would not adversely affect socioeconomic conditions during construction in a manner that could contribute to a physical environmental impact.
Impact CU-SE-7: Cumulative – Socioeconomic Impacts (Less than Significant)	Socioeconomic impacts are not considered significant impacts under CEQA unless they cause or can be used to measure the significance of a physical change in the environment. The proposed project in combination with other reasonably foreseeable development would not adversely affect socioeconomic conditions in the proposed project area in a manner that could contribute to a significant impact on the physical environment.

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3.5 VISUAL QUALITY/AESTHETICS

3.5.1 Introduction

This section describes the existing visual resources and quality in the study area, which encompasses the immediate vicinity around the new Transit Center, Second Street between Mission and Townsend Streets, and along Townsend Street. The project area is generally defined by Main Street on the east, Berry Street to the south, Seventh Street to the west, and Market Street to the north. This study area defines the geographic context and visual landscape within which the proposed project components can be viewed and could alter the aesthetics, streetscape, scenic resources, or views of the area.

The analysis in this section examines the changes to the visual environment that result from the proposed project components. These changes concentrate on the alteration of views and visual character and the loss of scenic resources. The analysis focuses on the proposed project component locations and whether conditions have changed since approval of the 2004 FEIS/EIR.

3.5.2 Affected Environment

For the purpose of describing visual resources and quality in the study area, the following definitions are used. The terminology is primarily based on definitions adopted by the Federal Highway Administration and are now commonly applied in visual assessments.

- A **viewshed** is defined as all of the surface area visible from a given viewpoint or series of viewpoints. A viewshed is a tool for identifying the views that a project could affect.

- A **scenic vista or scenic view** is a visibly prominent landscape containing scenic resources. Views from roadways that reveal major destinations or that provide overlooks of important routes and areas of the City or that assist the traveler in orientation are referred to as scenic vistas. Examples of scenic vistas are views of the San Francisco Bay and views of downtown from the Bay Bridge.

- **Scenic resources** include those natural (e.g., trees, rock outcroppings) and cultural features (e.g., regional or architectural landmarks that serve as focal points of interest) of the environment that can be potentially viewed. Examples are the Ferry Building, Coit Tower, and the Golden Gate Bridge.

- **Visual character** refers to the patterns (e.g., urban form, scale of development) that compose a visual landscape.

- **Visual exposure** refers to the position of the viewer to the resource.

- **Visual sensitivity** relates to the extent of the public's concern for a particular viewshed. Visual sensitivity depends on the location of the viewer, number of viewers, and duration of view. It also depends on the viewer's activity and awareness. For example, visual sensitivity is low for views seen by people commuting in heavy traffic. Visual sensitivity can be high for people driving for pleasure or relaxing in scenic surroundings.

The project area falls into three visually distinct study areas that coincide with those previously defined in Section 3.2, Land Use and Planning, Wind, and Shadow: northeast project subarea, central project subarea, and southwest project subarea. Visual attributes and characteristics of these study areas are described below.

Table 3.5-1 presents a summary of the proposed project components and identifies which viewshed subarea each component lies within (see also Figure 3.5-1). The table also summarizes viewshed visual quality, whether there are views to or from scenic resources at the proposed project component, and if the proposed project component is in proximity to sensitive viewers. A detailed description of viewshed subareas, viewshed/visual quality, scenic resources, and sensitive viewers follows this table. The study area is focused on project components that would include new construction or structures that could alter the visual setting. The existing visual quality and aesthetics conditions for the underground and certain ground-level components are not discussed further. These components are indicated with "N/A" in Table 3.5-1 because these components either would not be noticeable or would not add new structures aboveground.

Table 3.5-1
Visual Quality/Aesthetics Summary of Project Components

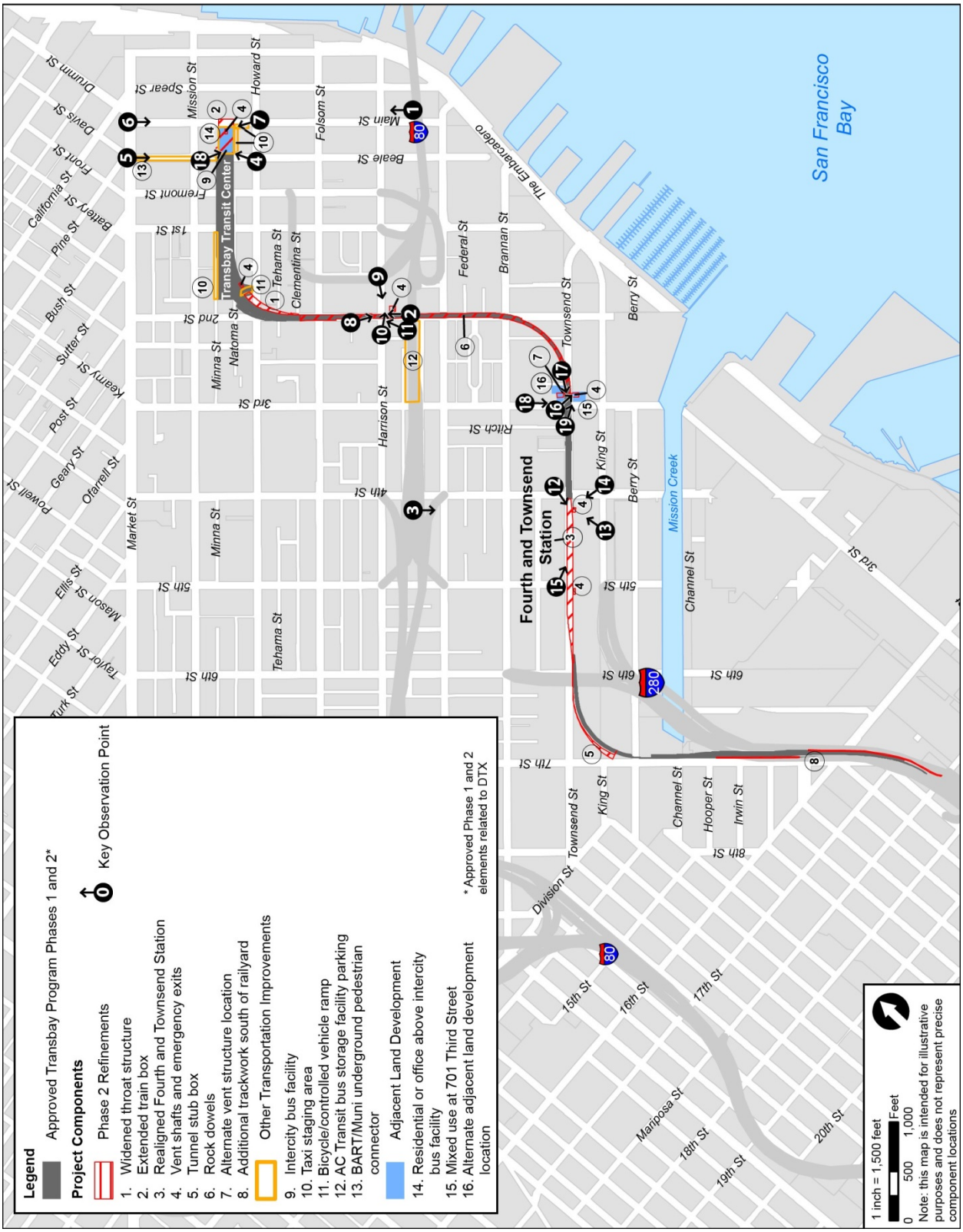
Project Component	Viewshed Subarea	Viewshed Visual Quality	Views to/from Scenic Resources	Proximity to Sensitive Viewers
Widened throat structure	Northeast	N/A	N/A	N/A
Extended train box	Northeast	N/A	N/A	N/A
Realigned Fourth and Townsend Street Station	Southwest	N/A	N/A	N/A
Townsend Street Station vent structures	Southwest	Low	No	Yes
Vent structure at 701 Third Street	Central	Low to moderate	Yes	Yes
Alternate vent structure at 699 Third Street/ 180 Townsend Street	Central	Low to moderate	Yes	Yes
Vent structure at Second and Harrison Streets	Central	Low	Yes	Yes
Transit Center vent structures	Northeast	N/A	N/A	N/A
Tunnel box stub	Northeast	N/A	N/A	N/A
Rock dowels	Central	N/A	N/A	N/A
Additional trackwork south of the Caltrain railyard	Southwest	N/A	N/A	N/A
Intercity bus facility	Northeast	Low to moderate	No	Yes
Taxi staging area	Northeast	N/A	N/A	N/A
Bicycle/controlled vehicle ramp	Northeast	N/A	N/A	N/A
AC Transit bus storage facility parking	Central	N/A	N/A	N/A
BART/Muni underground pedestrian connector	Northeast	N/A	N/A	N/A

Viewsheds

The viewsheds for the proposed project consist of the area in which the proposed project components would be visible. Viewsheds in the study area consist of urban development in the vicinity of the Transit Center, along Second Street, and along Townsend Street, where the proposed project components would be located. Sensitive viewing points within the viewsheds include parks, historic properties, and sidewalks that offer a view of the urban landscapes in the area. A description of the viewsheds is provided below.

Northeast Project Subarea

The northeast project subarea is generally bounded by Market Street to the north, Spear Street to the east, Third Street to the west, and Folsom Street to the south. This subarea is located within the southern Financial District of downtown San Francisco.



Sources: City and County of San Francisco 2013; compiled by AECOM in 2014

Figure 3.5-1 Locations of Proposed Project Components and Key Observation Points

The Transit Center is currently under construction, and the above-ground portion and train box are expected to be complete in 2017. The area around the Transit Center has a fairly "open" feeling due to a more moderately scaled development pattern compared to the area north of Minna Street (City of San Francisco 2012). However, this area is urban and currently undergoing rapid change from development associated with the Transit Center District Plan (TCDP). Implementation of the TCDP would shift the focus of the City's downtown to a concentration of high-rise buildings in the vicinity of the new Transit Center, resulting in a changed cityscape (City of San Francisco 2012).

The viewshed for this area would predominantly be from vantage points in the immediate vicinity of the proposed project components, particularly from Main Street between Harrison and Mission Streets. Because of the developed nature of the area and intervening development, the proposed project component sites would not be visible from mid- or long-range distances. The building heights in this viewshed drop off substantially from the high rises north of Minna Street, and the area is dominated by a mix of low- and mid-rise older buildings, some of which have been renovated, including mid-rise office, hotel, and residential uses, mostly east and west of the former bus ramps into the Temporary Terminal (City of San Francisco 2012). The Temporary Terminal at the surface lot surrounded by Howard, Beale, Main, and Folsom Streets, and adjacent parking lots immediately to the east and south, add to the open feeling in the area due to the lack of development at these sites that are surrounded by mid-rise buildings to the north. Under the TCDP, this area will experience densification and an increase in pedestrian activity. The TCDP emphasizes improving the pedestrian environment by sidewalk widening and improvements, landscaping and street furniture installation, and some on-street parking elimination.

Central Project Subarea

The central project subarea is generally bounded by Folsom Street to the north, First Street to the east, Third Street to the west, and King Street to the south. This subarea is located within the South of Market (SoMa) neighborhood of the greater downtown of San Francisco, extending from the southern Financial District to the north to Mission Bay.

Second Street, particularly between Jessie and Tehama Streets, has a distinctive character of mid-rise (three- to seven-story) masonry commercial buildings built in the early 20th century. The majority of the larger, contemporary buildings containing offices are located south of these distinctive masonry commercial buildings and north of Harrison Street. The north end of Second Street is pedestrian oriented, with uses such as ground-floor retail, restaurants, and offices. The south end of Second Street is lower in density and has less pedestrian-oriented uses at the ground level.

The viewshed for this area would predominantly be from vantage points in the immediate vicinity of the proposed project components, particularly from Second Street looking south toward Harrison Street, and from Harrison Street looking east toward Second Street. This area is characterized by contemporary low- to mid-rise buildings and surface parking lots, which do not contribute to an easily identifiable neighborhood.

Southwest Project Subarea

The southwest project subarea is generally bounded by Fourth Street on the east, Townsend Street on the north, Seventh Street on the west, and Mariposa Street on the south. It is centered along the Caltrain station and railyard, and the Caltrain rail line running from the railyard to Mariposa Street. This subarea is primarily located in the SoMa and Mission Bay areas of San Francisco.

This area is characterized by transportation infrastructure (Interstate [I] 280 off-ramp, railyard, Caltrain right-of-way) and contemporary mixed-use buildings with ground-floor retail and residential or office uses above. The west end of Townsend Street from Seventh Street to Fourth Street is dominated by the

open area created by the railyard. The north side of Townsend between Fourth and Second Streets is characterized by older low- to mid-rise concrete and brick buildings. The older buildings along Townsend Street are similar in character and scale. However, the south side of Townsend Street between Fourth and Third Streets is characterized by larger-scale contemporary buildings.

The viewshed for this area would predominantly be from vantage points in the immediate vicinity of the proposed project components, particularly from King and Townsend Streets. Building heights in this viewshed appear to be consistent in scale: larger and contemporary on the south side, and older and smaller scale on the north side. The west side is also visually different from the eastern end of this viewshed, as defined by transportation infrastructure and intensification of use, including additional residential, commercial, and office uses that occur along the street.

Scenic Views/Vistas and Scenic Resources

Scenic vistas are considered visibly prominent landscapes containing scenic resources. Views from roadways that reveal major destinations or that provide overlooks of important routes and areas of a city and assist travelers in orientation are referred to as scenic vistas. Scenic resources include natural (e.g., trees, rock outcroppings) and cultural features (e.g., regional or architecturally distinctive buildings that serve as focal points of interest) of the environment that can be potentially viewed. Views of the downtown skyline and views of the Bay from downtown, and views of downtown from the waterfront are considered scenic views for this analysis. Scenic resources in the vicinity of the project study area are I-80 (an eligible scenic highway), The Embarcadero, AT&T Park (a distinctive building), and the Bay.

The San Francisco General Plan places importance on protecting public views of open space and water bodies, views of downtown, and views to the City's hills. The Urban Design Element classifies certain streets in terms of their importance as visual resources and the quality of street views available from vantage points along those streets (City of San Francisco 2012). Market Street is characterized as a street containing a "Street View of Important Building" and a "Street that Defines City Form." Mission, Howard, and Folsom Streets are characterized by the General Plan as having "average" quality of views, and views along these streets between First and Third Streets are characterized as having "good" quality of street views (City of San Francisco 2012).

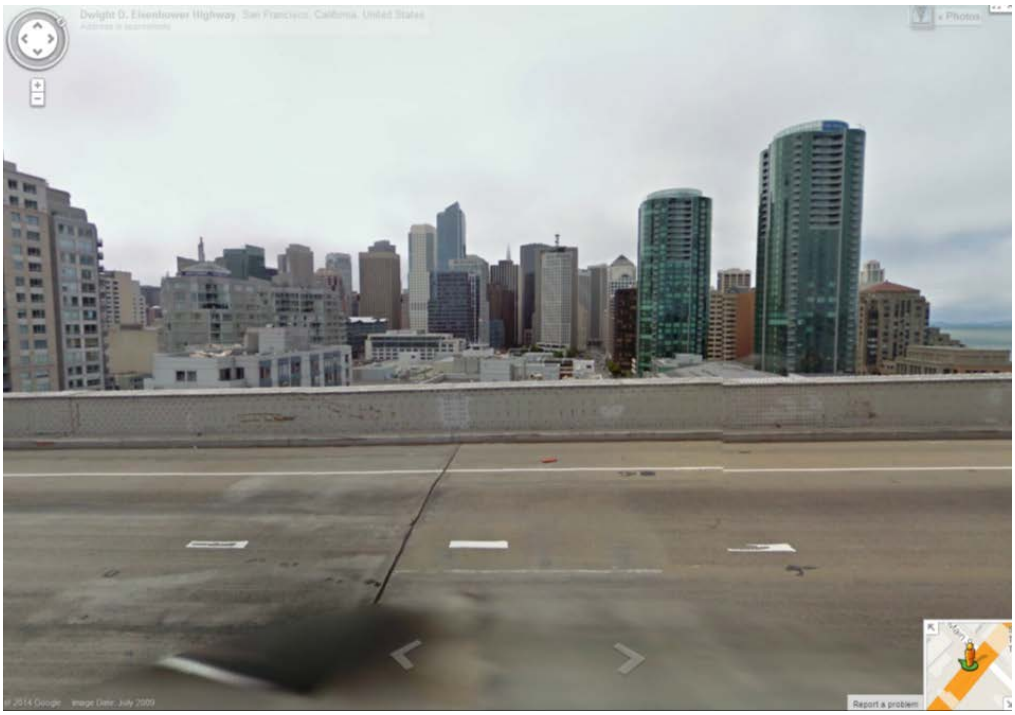
Within the study area, there are no vegetation stands or rock outcrops; thus, scenic natural resources are absent. Instead, the scenic resources relate to the open waters of the Bay and to the built environment, as identified in the Urban Design Element.

Due to level topography and regular street grid of the study area, regional landmarks are visible in well-defined visual corridors created by major east/west streets, such as Market, Mission, Folsom, Harrison, and Howard Streets. Twin Peaks, which are two hills with an elevation of approximately 922 feet near the geographic center of San Francisco, can be seen to the west, and the San Francisco Bay is visible to the east along these corridors. None of the proposed project components would be within these visual corridors.

The study area is not visible when viewed from areas of the City to the west, north, or east due to intervening development. The proposed project components are located in the downtown and SoMa areas; therefore, the following discussion describes whether the proposed project component sites would be within a scenic vista (i.e., view of downtown) and/or visible from a scenic resource. As described below, the proposed project would not be visually noticeable within a scenic view and would not be visible from a scenic resource.

Northeast Project Subarea

I-80 is an eligible, but not officially designated, state scenic highway. Motorists heading west have scenic views of the downtown skyline and the Bay to the north. Figure 3.5-2 shows the scenic view of the downtown skyline looking north along Main Street toward the site of the proposed intercity bus facility. Most of the Transit Center area is not visible from I-80 due to intervening development. The view is dominated by high-rise office buildings in downtown San Francisco and mid-rise mixed-use buildings and high-rise residential towers in SoMa. No natural vegetation or rock outcrops are present at the site or in the immediate vicinity, and, thus, natural scenic resources are absent.



Source: Adapted by AECOM in 2014 from Google Maps

Figure 3.5-2 View from I-80 Looking North along Main Street
(Key Observation Point #1 in Figure 3.5-1)

Central Project Subarea

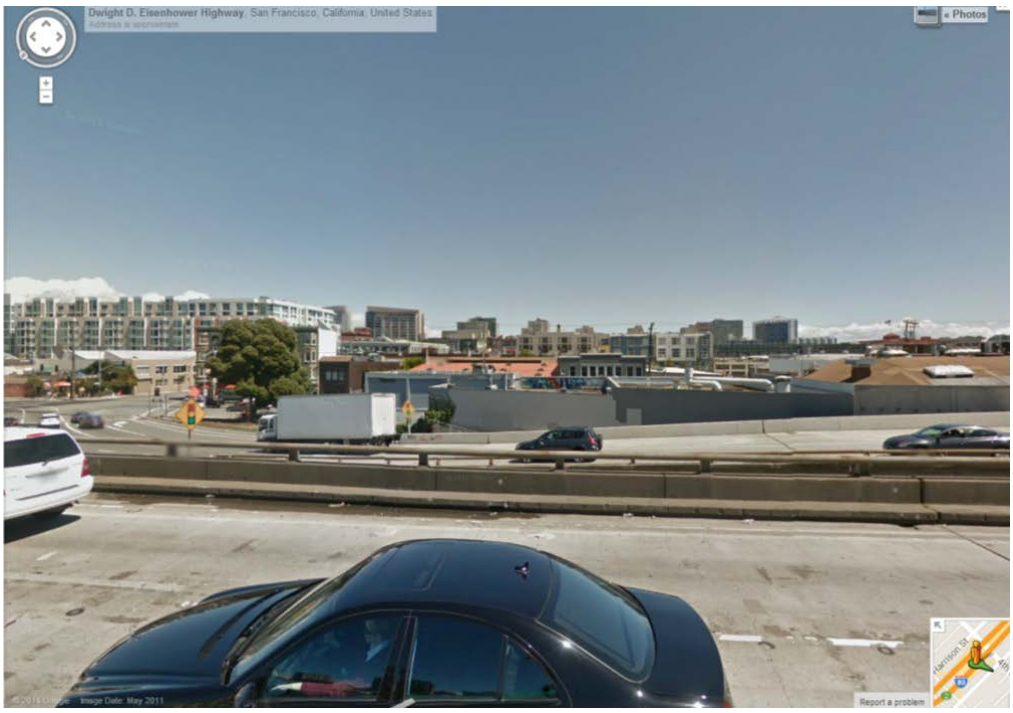
Motorists heading west would have scenic views of the downtown skyline looking north. Figure 3.5-3 shows a partial scenic view of the downtown skyline and a portion of the southeast corner of Second and Harrison Streets. Most of the view downtown is obscured due to intervening development along Second Street. At ground level there are distant views of the Bay at Howard Street looking east from Second Street. AT&T Park is a notable feature in the City, and is visible from Second Street beginning at Harrison Street and then southward. No proposed project component sites are visible from the waterfront area to the east. No natural vegetation stands or rock outcrops are present at the site or in the immediate vicinity, and, thus, natural scenic resources are absent.

Southwest Project Subarea

The proposed project area is not visible from I-80 due to intervening development between Bryant and Townsend Streets (Figure 3.5-4). This project subarea is also not visible from the waterfront areas to the south and east. No natural vegetation stands or rock outcrops are present at the site or in the immediate vicinity, and, thus, natural scenic resources are absent.

Source: Adapted by AECOM in 2014 from Google Maps

Figure 3.5-3 View from I-80 Looking North along Second Street
(Key Observation Point #2 in Figure 3.5-1)



Source: Adapted by AECOM in 2014 from Google Maps

Figure 3.5-4 View from I-80 Looking South toward the Railyard
(Key Observation Point #3 in Figure 3.5-1)

Visual Character and Quality

Visual character refers to the patterns that make up a visual landscape. The introduction of incompatible visual elements to the proposed project sites would be considered a significant impact on the visual character of the area. The study area reflects the changing development patterns and uses over the past century, and is undergoing change due to the TCDP and other area plans. The study area contains a combination of low-, mid-, and high-rise buildings, ranging from early 20th century buildings to contemporary office and residential towers (City of San Francisco 2012). Elevated freeway segments, the Bay Bridge, and related off-ramps intersect blocks and streets in the various neighborhoods that comprise the study area. Overhead utilities, signage, and electric Muni connections punctuate the visible landscape. The study area does not have a high degree of visual definition or coherence. However, the rectilinear and relatively large street blocks provide order. First Street divides smaller blocks north and east of Market Street from the larger blocks south of Market Street. Blocks south of Market Street are approximately twice the size of blocks to the east of First Street and nearly four times as large as the blocks north of Market Street (FTA 2004).

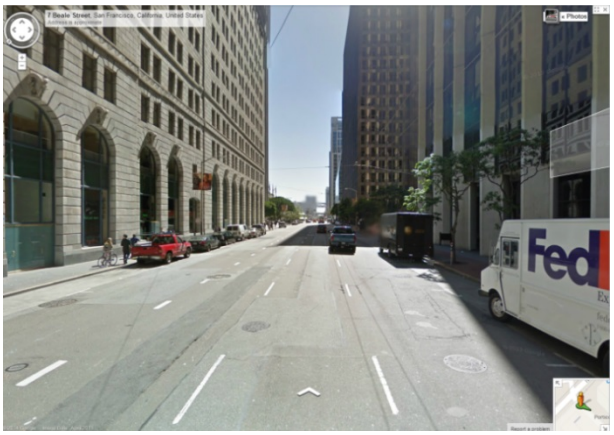
The visual context and character of the areas in the immediate vicinity of the proposed project components are described below. For this discussion, the terms foreground, middleground, and background are used; foreground elements are those features closest to the viewer and generally within the same block, middleground is between the foreground and background (approximately two blocks away), and background are features farthest from the viewer and more than two blocks away. This discussion uses a similar approach to evaluate aesthetic values as the TCDP EIR (City of San Francisco 2012) to be consistent with recent visual analysis in the study area. Visual elements with neutral or low aesthetic value include surface parking lots, vacant parcels, and underutilized industrial-type buildings (City of San Francisco 2012). New open spaces and streetscaping improvements are considered to enhance the visual quality (City of San Francisco 2012).

Northeast Project Subarea

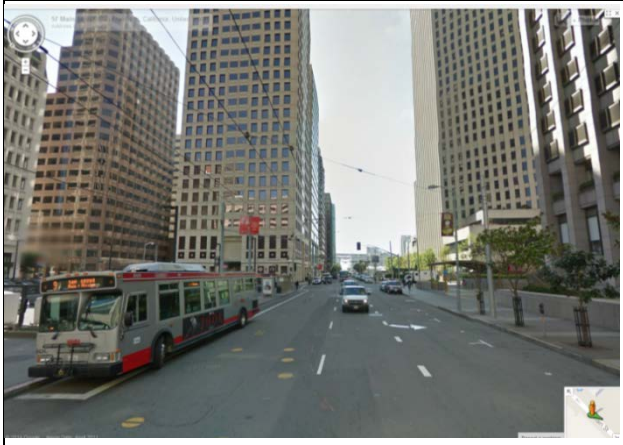
Figures 3.5-5a through 3.5-5d show existing views of the proposed intercity bus facility and the vent structure at Natoma and Main Streets (between Main and Beale Streets). As shown in the figures, this area is developed and conveys an urbanized feel, consisting of regular sidewalks and intersections and overhead utility wires (City of San Francisco 2012). Beale and Main Streets, which run north/south, are four- and three-lane roadways, respectively, and are dominant linear features extending from the foreground to background. This area is characterized by contemporary buildings that include features and massing such as unadorned facades, glass curtain walls, external skeleton detailing, and a regular pattern of fenestration (City of San Francisco 2012). Buildings north of Mission Street establish a built-up, vertically oriented character. The majority of building heights step down along Beale and Main Streets toward the Bay Bridge and away from the downtown urban core.

The proposed intercity bus facility and the vent structure at Natoma and Main Streets on the block bounded by Mission, Beale, Main, and Howard Streets is currently used for parking and construction staging. The views from Beale and Howard Streets looking northeast (Figure 3.5-5a) and from Main and Howard Streets looking northwest (Figure 3.5-5d) show the proposed site for these components. As shown in the figures, this site contains no development and shows a dramatic drop from the high rises to the north to the mid-rise buildings along Beale and Main Streets. The undeveloped area also adds to an open feeling in the area due to the lack of buildings and density. The building in the middleground of Figure 3.5-5a and background of Figure 3.5-5d is 201 Mission Street, a 30-story, 417-foot-tall building. Views of the south end of 201 Mission Street are obscured by fencing in the foreground and trees that are approximately 10 to 30 feet in height. There are very few restaurants or retail uses at street level in this area, contributing to a low level of pedestrian activity compared to the downtown area to the north. The

3.5-5a View from Beale and Howard Streets Looking Northeast
(Key Observation Point #4 in Figure 3.5-1)



3.5-5b View from Market and Beale Streets Looking South
(Key Observation Point #5 in Figure 3.5-1)



3.5-5c View from Main Street Looking South
(Key Observation Point #6 in Figure 3.5-1)

3.5-5d View from Main and Howard Streets Looking Northwest
(Key Observation Point #7 in Figure 3.5-1)

Source: Adapted by AECOM in 2014 from Google Maps

Figures 3.5-5a–5d Views of the Proposed Intercity Bus Facility and Transit Center Eastern Vent Structure Site and Environs

site of the proposed intercity bus facility and the vent structure at Natoma and Main Streets has low to moderate aesthetic value due to its use for parking and construction staging (Figure 3.5-5e).

The buildings in this area are contemporary in design, with varied heights. There are no distinctive patterns or notable visual attributes, resulting in an area that does not have a high level of visual definition or cohesion other than that of a highly urbanized area.

Central Project Subarea

Figures 3.5-6a through 3.5-6c show existing views of the proposed vent structure location at the southeast corner of Second and Harrison Streets. This area is developed and conveys an urbanized feel. Although there are regular sidewalks and intersections, this area lacks pedestrian activity due to the lower-density development and no active street-level uses.

Figure 3.5-5e View of the Proposed Intercity Bus Facility and Transit Center Eastern Vent Structure Site and Environs looking North

Harrison Street is an east/west roadway with five lanes. Second Street is a north/south roadway with four lanes. Harrison Street is heavily used by vehicles, particularly during the evening commute by motorists heading west toward the I-80 on-ramp at Fourth Street. Both Harrison and Second Streets are dominant linear features extending from the foreground to the background (Figures 3.5-6b and 3.5-6d). This area is characterized by contemporary low- and mid-rise buildings (four to eight stories tall) with unadorned concrete and glass facades.

The proposed vent structure site at Second and Harrison Streets is currently used for parking. As shown in Figure 3.5-6c, this site abuts two buildings: one is a residential building containing 33 units that contains windows looking out at the parking lot, and the other is a six-floor mixed-use building without windows facing the parking lot. Portions of I-80, which is south of this site, are visible in the middleground in Figures 3.5-6a and 3.5-6b. One notable feature in the area is the One Rincon Tower, east of the site and visible in the background of Figure 3.5-6c; however, the rest of the buildings along Harrison Street in the middleground and background are similar in height, resulting in a visually uniform appearance.

3.5-6a View of Proposed Vent Structure Site at Second and Harrison Streets Looking Southeast
(Key Observation Point #8 in Figure 3.5-1)

3.5-6b View of Proposed Vent Structure Site at Second and Harrison Streets Looking West Toward Second Street
(Key Observation Point #9 in Figure 3.5-1)

3.5-6c View of Proposed Vent Structure Site at Second and Harrison Streets from Harrison Street Looking East Toward Second Street
(Key Observation Point #10 in Figure 3.5-1)

3.5-6d View of Proposed Vent Structure Site at Second and Harrison Streets Looking North/Northeast Toward Harrison Street
(Key Observation Point #11 in Figure 3.5-1)

Source: Adapted by AECOM in 2014 from Google Maps

Figures 3.5-6a–6d Views of Proposed Vent Structure Site and Environs at Second and Harrison Streets

The site of the proposed vent structure at Second and Harrison Streets is low in aesthetic value due to its use as a parking lot. Overall, the buildings in this area are similar in height and contemporary in appearance. The uniform appearance of the buildings does not provide distinctive patterns or notable visual attributes, resulting in an area that does not have a high level of visual definition.

Southwest Project Subarea

Figures 3.5-7a through 3.5-7d show existing views of the proposed Fourth and Townsend Street Station vent structures within the Caltrain railyard (bounded by Seventh, Townsend, Fourth, and King Streets).

The Caltrain railyard and surrounding area are developed; however, they do not have a dense, urbanized feel like the downtown area. There are regular sidewalks and intersections where there is a high level of pedestrian activity due to the Caltrain station. King Street is an east/west roadway with six lanes (four lanes eastbound, two lanes westbound) on the south side of the railyard. Townsend Street is a three-lane

3.5-7a View of Proposed Fourth and Townsend Street Station Vent Structure Site from Townsend and Fourth Streets Looking Southwest
(Key Observation Point #12 in Figure 3.5-1)

3.5-7b View of Proposed Fourth and Townsend Street Station Vent Structure Site from King Street Looking Northeast
(Key Observation Point #13 in Figure 3.5-1)

3.5-7c View of Existing Caltrain Station from King and Fourth Streets Looking Northwest
(Key Observation Point #14 in Figure 3.5-1)

3.5-7d View of Proposed Fourth and Townsend Street Station Vent Structure Site from Townsend and Fifth Streets Looking Southeast
(Key Observation Point #15 in Figure 3.5-1)

Source: Adapted by AECOM in 2014 from Google Maps

Figures 3.5-7a–7d Views of the Proposed Fourth and Townsend Street Station Vent Structure Sites and Environs

roadway (two lanes eastbound and one lane westbound) on the north side of the railyard. Fourth Street is a five-lane roadway (three lanes southbound, two lanes northbound) on the east side of the railyard. These streets are heavily used by motorists/commuters as major access points for I-280. Townsend Street and Fourth Street and associated Muni overhead lines are dominant linear features extending from the foreground to the background (as shown in Figures 3.5-7a and 3.5-7c). Railyard fencing and the rails themselves are the dominant middleground features seen from King Street, as shown in Figures 3.5-7b and 3.5-7d, and provide well-defined edges of the proposed project component site.

This area is characterized by a mix of low- and mid-rise apartment and commercial buildings surrounding the railyard. King and Fourth Streets are characterized by contemporary buildings that feature unadorned facades, glass curtain walls, external skeleton detailing, and a regular pattern of fenestration (as shown in Figures 3.5-7a, 3.5-7c, and 3.5-7d). Townsend Street, north of the railyard, has a notably different character, consisting of low-rise, older concrete and brick buildings (as shown in Figures 3.5-7a through

3.5-7d). The railyard has a low profile, allowing for expansive views to surrounding areas, as shown in the figures.

The site of the proposed Fourth and Townsend Street Station vent structures is low in aesthetic value due to its use as a railyard, and is completely separated from surrounding areas. Overall, the area has a low profile, with buildings of similar height and bulk. The low profile contributes to an open feeling. Due to the wide range of visual characteristics (e.g., railyard, contemporary and older buildings) and lack of distinctive patterns or notable visual attributes, the area does not have a high level of cohesiveness or visual definition.

Figures 3.5-8a through 3.5-8d show existing views of the proposed vent structure site at 701 Third Street at the southeast corner and alternate site at the northeast corner of Townsend and Third Streets. The proposed vent structure site at 701 Third Street is currently occupied by a fast food restaurant. There are regular sidewalks and intersections, with a high level of pedestrian activity due to the proximity to the Caltrain station and AT&T Park—two major destinations in the southwest project subarea.

Figure 3.5-8a View of Proposed Vent Structure Site at 701 Third Street from Townsend and Third Streets Looking Southeast
(Key Observation Point #16 in Figure 3.5-1)

Figure 3.5-8b View of Proposed Vent Structure Site at 701 Third Street and Alternate Site from Townsend Street Looking West Toward Third Street
(Key Observation Point #17 in Figure 3.5-1)

Figure 3.5-8c View of Proposed Vent Structure Site at 701 Third Street and Alternate Site from Third Street Looking South Toward Townsend Street
(Key Observation Point #18 in Figure 3.5-1)

Figure 3.5-8d View of Proposed Vent Structure Site at 701 Third Street and Alternate Site from Townsend Street Looking East Toward Third Street
(Key Observation Point #19 in Figure 3.5-1)

Source: Adapted by AECOM in 2014 from Google Maps

Figures 3.5-8a–8d Views of the Proposed Vent Structure Site and Environs at Third and Townsend Streets

Townsend Street is an east/west roadway with two lanes (one lane each way, transitioning to two westbound lanes west of Third Street). Third Street is a north/south roadway with four northbound lanes. Townsend and Third Streets and associated Muni overhead lines are dominant linear features, extending from the foreground to background (as shown in Figures 3.5-8a through 3.5-8d). This area is characterized by a mix of low- and mid-rise mixed-use residential and commercial buildings. The buildings immediately adjacent to the fast food restaurant and at the southwest and northwest corners are contemporary in design, with rectilinear features and unadorned concrete and glass facades. The contemporary buildings are between five and 10 stories tall and are similar in character and bulk.

Buildings along both sides of Townsend Street (east of Third Street) have a notably different character and consist of older concrete and brick buildings (as shown in Figures 3.5-8d). These older buildings contain office and retail uses, and are similar in character, height, and bulk.

The fast food restaurant at the site of the proposed vent structure at 701 Third Street is one-story tall, which is significantly shorter than most of the adjacent development, and it has a bright red rooftop. The difference in the building's character to the surrounding area, height, and color draws the viewer's eye to the site. The existing building's visual character is markedly different from the surrounding area (as shown in Figures 3.5-8a through 3.5-8d); therefore, it is not cohesive with the adjacent buildings. Because of the wide range of visual characteristics (i.e., contemporary and older buildings) and lack of distinctive patterns and notable visual attributes, the area does not have a high level of cohesiveness or visual definition, and is low to moderate in aesthetic value.

The alternate vent structure site at the northeast corner of Third and Townsend Streets is currently developed with a liquor store and professional offices that are two stories tall. The buildings are shorter than most of the adjacent development, and the visual character is different from the surrounding area (as shown in Figures 3.5-8a through 3.5-8d). Therefore, no sense of visual cohesion exists between the buildings at the alternate vent structure site and the adjacent buildings. Similar to the site at 701 Third Street, because of the wide range of visual characteristics (i.e., contemporary and older buildings) and lack of distinctive patterns and notable visual attributes, the area does not have a high level of cohesiveness or visual definition, and is low to moderate in aesthetic value.

Visual Exposure and Sensitivity

For purposes of this discussion, viewers in the area of the proposed project components consist of roadway travelers, pedestrians, residents, and workers or owners of businesses. Roadway travelers would include those on highways or City streets. I-80, a heavily traveled freeway, passes through the study area. Travelers on I-80 within the study area have wide-open views because the freeway is elevated above street level, with occasional panoramic views of the City skyline. Given the number of viewers, the elevated views, and the diverse skyline, roadway travelers are considered to have moderate visual sensitivity to changes in views. The surface streets adjacent to proposed project components, such as Townsend Street, Second Street, and Main Street, usually are congested with automobiles and buses during commute hours. Travelers on these surface streets are considered to have low visual sensitivity to changes in views because they are generally not anticipating or seeking scenic views.

The study area is characterized by mixed uses, including residential and commercial uses. Residential properties and businesses are located directly adjacent to or in the vicinity of the proposed project component sites. Residents could have direct views of the City skyline and the Bay, and are likely to have a high sense of ownership of the neighborhood that surrounds them. Residents in the study area are considered to have high sensitivity to changes in the views because of their extended viewing times, short distance to the proposed project component sites, and sense of ownership. Employees and owners of the businesses are likely to be occupied with work activities, but may spend leisure time in the area during off

hours. Owners and employees of businesses are considered to have moderate sensitivity to changes in views because of their limited viewing time.

Light and Glare

The study area is situated in a wholly urbanized area; therefore, lighting is an expected common element. Sources of light and glare are predominantly limited to the interior and exterior lights of buildings and lighting visible through windows, from parking lots, and from City streets (City of San Francisco 2012). These sources of light are typical of those in a developed urban area. The downtown area has the greatest concentration of tall buildings in the City, and presents the greatest intensity of night lighting sources; lighted high-rise buildings can be seen from long distances (City of San Francisco 2012).

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies related to visual quality and aesthetics, including new guidance issued since the 2004 FEIS/EIR.

State

Senate Bill 743 and Public Resources Code 21099

On September 27, 2013, Senate Bill (SB) 743 was enacted, becoming effective on January 1, 2014. SB 743 added Section 21099 to the PRC (effective on January 1, 2014) and eliminated the analysis of aesthetics for certain urban infill projects under CEQA. The potential future development associated with the vent structure sites and the intercity bus facility meets the definition of infill located within a transit priority area, as specified by Section 21099. Accordingly, from a CEQA perspective, this document does not provide CEQA conclusions regarding aesthetics impacts from the potential land development at the vent structure and the intercity bus facility development sites because they are on infill sites within a transit priority area (PRC § 21099(d)).

California Scenic Highway Program

California's Scenic Highway Program was created by the state legislature in 1963. Its purpose is to protect and enhance the natural scenic beauty of California highways and adjacent corridors through conservation. The Scenic Highway Program consists of eligible and officially designated routes. A highway may be designated as eligible for listing as a State Scenic Highway if it offers travelers scenic views of the natural landscape that is largely undisrupted by development. Eligible routes may be officially designated as scenic highways when the local jurisdiction adopts ordinances to establish a scenic corridor protection program and receives approval from the California Department of Transportation. In San Francisco, I-80 and Highway 1 are designated as eligible State Scenic Highways. I-80, the closest eligible State Scenic Highway to the proposed project area, is approximately 1,800 feet south of the study area.

Local

San Francisco General Plan

The San Francisco General Plan Urban Design Element (City of San Francisco 2013) provides policies and objectives to guide urban design decisions, including for aesthetics. The Urban Design Element calls for preserving and enhancing views and visual quality, as well as for new development to complement existing patterns of development. In addition, the General Plan states that access to San Francisco Bay should be considered as a total system that includes physical contact with the water and the shore, and visual contact through views of the water and water-related activities.

The General Plan includes policies that promote solar access and avoid shade to maintain the usability of public open space, in compliance with the requirements of Planning Code Section 295. The policies further protect open spaces that are under the jurisdiction of other public agencies or are privately owned, and thus not protected by the Planning Code amendments requiring that they not be shaded during the hours of their most intensive use.

The General Plan policies below are among those applicable to the proposed project.

Urban Design Element

Objective 1: Emphasis of the characteristic pattern which gives to the city and its neighborhoods an image, a sense of purpose, and a means of orientation.

- Policy 1.1: Recognize and protect major views in the city, with particular attention to those of open space and water.
- Policy 1.3: Recognize that buildings, when seen together, produce a total effect that characterizes the city and its districts.
- Policy 1.6: Make centers of activity more prominent through design of street features and by other means.

Objective 2: Conservation of resources which provide a sense of nature, continuity with the past, and freedom from overcrowding.

- Policy 2.6: Respect the character of older development nearby in the design of new buildings.

Objective 3: Moderation of major new development to complement the city pattern, the resources to be conserved, and the neighborhood environment.

- Policy 3.2: Avoid extreme contrasts in color, shape and other characteristics which will cause new buildings to stand out in excess of their public importance.
- Policy 3.4: Promote building forms that will respect and improve the integrity of open spaces and other public areas.
- Policy 3.5: Relate the height of buildings to important attributes of the city pattern and to the height and character of existing development.
- Policy 3.6: Relate the bulk of buildings to the prevailing scale of development to avoid an overwhelming or dominating appearance in new construction.

Recreation and Open Space Element

- Policy 2.3: Preserve sunlight in public open spaces. [Note: This same text is contained in Policy 1.9 of the November 2013 revised draft Recreation and Open Space Element, which is being prepared to update the existing Recreation and Open Space Element.]

South of Market Area Plan

The SoMa Area Plan contains goals, objectives, and policies for the conservation and development of the SoMa area of San Francisco. The SoMa Area Plan also recognizes the need to provide a mixture of

employment opportunities, especially for San Franciscans, while maintaining and facilitating the expansion of a very important segment of the City's overall economic base: the light industrial, home, and business service industries. Plan goals specific to visual resources and aesthetics are identified below.

Objective 7: Preserve existing amenities which make the South of Market area a pleasant place to live, work, and visit.

- Policy 7.1: Establish height and building intensity limits for new development which would preserve the existing scale and strengthen the physical form of areas appropriate for new development, enhance the character of adjacent landmark buildings, maintain sun exposure to open space resources, and preserve view corridors.

- Policy 7.2*:* Preserve the architectural character and identity of South of Market residential and commercial/industrial buildings.

- Policy 7.3: Preserve areas which contain groups of buildings of historic, architectural, or aesthetic value and which are linked by important historical or architectural characteristics.

- Policy 7.4: Preserve individual architecturally and/or historically significant buildings which contribute to the area's identity, give visual orientation, and which impart a sense of continuity with San Francisco's past.

Central SoMa Plan

The Central SoMa Plan recognizes the need to plan for growth in the SoMa area that is consistent with the City's Transit First Policy and in a way that enhances the existing landscape but adds new elements reflective of the area's physical and cultural position in the City. The Central SoMa Plan policy statements below relate specifically to visual resources and aesthetics.

GOAL 2: Shape the area's urban form recognizing both city and neighborhood contexts.

GOAL 3: Maintain the area's vibrant economic and physical diversity.

GOAL 4: Support growth with improved streets, additional open space, and other elements of "complete communities."

Objective 1: Enhance the City skyline in harmony with and respectful of the city pattern, including views across SoMa to and from the hills, bay, and Downtown.

- Urban Form Principle 1: Heights should be sculpted mindful of views through and across the area from surrounding areas with views of the bay, east bay hills, and other key features.

- Urban Form Principle 5: Height limits should be appropriate for the central city location and transit access, and should serve to diminish the dominant presence of the freeway in the neighborhood.

- Urban Form Principle 6: The diverse scale of buildings in the plan area should be maintained, particularly areas with a fine grain concentration of smaller lots and buildings.

- Open Space Principle 1: Provide a safe, convenient and attractive walking environment on all streets in the plan area.

Transbay Redevelopment Plan

The Transbay Redevelopment Plan was part of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Transbay Program), which was evaluated in the 2004 FEIS/EIR. The Transbay Redevelopment Plan encompasses approximately 40 acres and consists of the Transbay Residential Zone (Zone 1) and the Transbay C-3 Zone (Zone 2). Zone 1 is under the jurisdiction of the San Francisco Office of Community Investment and Infrastructure. The Redevelopment Plan calls for the development of Zone 1, which consists of approximately 12 acres of property that were formerly occupied by portions of the Embarcadero Freeway, into a vibrant downtown neighborhood. When completed, this neighborhood will consist of new office space north of Howard Street, new housing south of Howard Street, new neighborhood retail space concentrated on Folsom Street, and a number of public improvements such as widened sidewalks and open spaces.

Zone 2 is primarily under the jurisdiction of the San Francisco Planning Commission. The Redevelopment Plan calls for the revitalization of the area surrounding the former Transbay Terminal. The plan focuses on a mix of uses to revitalize the area, support transit, add significant amounts of housing to the SoMa area, and add transit-oriented development. The Redevelopment Plan and related development would permit financing mechanisms to assist in financing transportation improvements and other redevelopment projects.

Transit Center District Plan

The TCDP contains goals, objectives, and policies that build on the Downtown Plan's vision for the area around the Transit Center as the heart of the new downtown. Encompassing 145 acres, the TCDP overlaps and supersedes portions of the above-described Transbay Redevelopment Plan. The TCDP recognizes the need to provide improvements to the public realm, and establishes new planning policies and controls for land use; urban form, including building height and design; street network modifications/public realm improvements; historic preservation; and district sustainability, including enhancement of green building standards in the district, among other features. The TCDP goals specific to visual resources and aesthetics are described below.

- Build on the General Plan's Urban Design Element and Downtown Plan, establishing controls, guidelines, and standards to advance existing policies of livability, as well as those that protect the unique qualities of place.

- Create a framework for a network of public streets and open spaces that support the transit system and provide a wide variety of public amenities and a world-class pedestrian experience.

Objective 1.5: Activate alleys and mid-block pedestrian walkways with active uses in adjacent buildings to make these spaces attractive and enjoyable.

Objective 2.2: Create an elegant downtown skyline, building on existing policy to craft a distinct downtown "hill" form, with its apex at the Transit Center, and tapering in all directions.

Objective 2.9: Provide building articulation above a building base to maintain or create a distinctive streetwall compatible with the street's width and character.

Objective 2.12: Ensure that development is pedestrian-oriented, fostering a vital and active street life.

Objective 2.13: Enact urban design controls to ensure that the ground-level interface of buildings is active and engaging for pedestrians, in addition to providing adequate supporting retail and public services for the district.

Objective 2.15: Encourage articulation of the building façade to help define the pedestrian realm.

Objective 2.17: Promote a high level of quality of design and execution, and enhance the design and material quality of the neighboring architecture.

- Policy 2.25: Assure that new buildings contribute to the visual unity of the city.

Eastern Neighborhoods Rezoning and Area Plan

Adopted in December 2008, the Eastern Neighborhoods Plan was created, in part, to support housing development in some areas previously zoned for industrial uses, while preserving an adequate supply of space for existing and future production, distribution, and repair employment and businesses. Goals of the Eastern Neighborhoods Plan related to aesthetics include improving the character of streets, improving community facilities, and enhancing open spaces (City of San Francisco 2008).

Reflective Glass (Planning Commission Resolution 9212)

Planning Commission Resolution No. 9212 (1981) established guidelines for proposed building projects. The first guideline states that clear, untinted glass should be used at and near the street level. The second guideline states that mirrored, highly reflective, or densely tinted glass should not be used except as an architectural or decorative element. By prohibiting mirrored or reflective glass, this resolution serves to limit glare.

3.5.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The 2004 FEIS/EIR determined that no adverse effect or significant visual quality/aesthetic impacts would occur for the Transbay Program in the project area. In addition to analyzing the proposed change in the project, this SEIS/EIR updates the current visual setting, which has changed since approval of the 2004 FEIS/EIR. This analysis evaluates the proposed project components to determine if adverse visual impacts would occur.

The proposed project would be subject to SB 743 and Section 21099 of the Public Resources Code, which eliminated the analysis of aesthetics impacts for certain urban infill projects under CEQA. As described in Section 3.1, Introduction, the land development adjacent to the project facilities on the vent structure sites and intercity bus facility site is considered part of the proposed project under CEQA and not part of the NEPA undertaking. Because the adjacent land development is not under FTA's jurisdiction, it is not considered part of the NEPA action. However, the adjacent land development would be an indirect effect and is evaluated as such under each impact statement in this section.

The adjacent land development meets the definition of a mixed-use residential, residential, or employment center infill project in a transit priority area under SB 743. Therefore, aesthetic impacts of these uses are not considered impacts on the environment under CEQA, and no CEQA conclusions regarding aesthetics for the land development adjacent to the project facilities on the vent structure sites and the intercity bus facility site are provided in this document. As more detailed plans evolve for future development, they may require additional CEQA environmental review by the City. If the adjacent land development does not meet SB 743 requirements in the future (i.e., if the FAR is less than 0.75, or a different use), an aesthetics impact analysis could be required at that time. CEQA conclusions for the proposed project components associated with transportation facilities and improvements are provided because they do not meet the requirement for urban infill under SB 743.

The proposed project would have a potentially significant impact related to visual quality/aesthetics if it were to do any of the following:

- create a substantial adverse effect on a scenic vista;
- substantially damage scenic resources, including trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting;
- substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area, or that would substantially affect other people or properties.

Issues Not Addressed Further in this SEIS/EIR

Scenic Natural Resources. There are no substantial stands of trees, rock outcroppings, or other natural features in the study area that are typically prized for their scenic qualities. As described in "Affected Environment," above, scenic resources include the San Francisco Bay and built structures that have distinctive architectural features and interest. Accordingly, further evaluation of scenic natural resources, other than San Francisco Bay, is not included in this SEIS/EIR.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project as described in this SEIS/EIR would not be implemented, the visual quality and aesthetic effects will be the same as those presented in Section 5.16 Visual and Aesthetics (pages 5-112 to 5-121) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects, plus Mitigation Measures VA 1 and VA 2, which were previously adopted and incorporated into the Transbay Program, is provided below. The full text for the mitigation measures are presented in Appendix C of this SEIS/EIR.

Scenic Views or Vistas. Some views from within the area will be improved because of the removal of existing elevated ramps, but other views across the Transbay Redevelopment Project Area will be limited by new development that will block scenic views of the City in several directions. Views across the Transbay Redevelopment Project Area will be lessened by increased development in this area, which will move the current visual boundary between the Financial District and lower-scale development south of Mission Street southward, making the existing high-rise development less pronounced when viewed from the Transbay Redevelopment Project Area. New development will be required to comply with applicable urban design guidelines to enhance views and visual interest in the Transbay Program area. The 2004 FEIR/EIS concluded that there will be no adverse effects/less-than-significant impacts on scenic views or vistas.

Visual Character and Quality. Visual changes will occur as a result of implementing the Transbay Program. Construction of the Downtown Rail Extension (DTX) will entail acquisition and demolition of some buildings along portions of its alignment; however, it was previously assumed that new buildings would be constructed on these specific sites and developed at a similar or larger scale. The Transbay Program will retain the historic and smaller-scale buildings along Second Street, and Folsom Street will undergo the most visible change from the Transbay Redevelopment. Redevelopment projects approved in the 2004 FEIS/EIR will remove features with low visual value, including surface parking lots and, in some cases, deteriorated buildings, potentially enhancing the overall character of the Transbay

Redevelopment Project Area. The 2004 FEIS/EIR concluded that the Transbay Program will have a no adverse effect/less-than-significant impact.

Light and Glare. The Transbay Program will result in additional night lighting in the area, but the amount of light is typical for illuminating a transportation hub in a developed urban area. The design of the Transit Center will provide visual identity and increased security for passengers within the building and surrounding pedestrian areas. In addition, new buildings as part of the Redevelopment Area will not be constructed using reflective glass. As a result, the 2004 FEIS/EIR concluded that a no adverse effect/less-than-significant impact will occur regarding light and glare.

Construction. Construction activities, equipment, and supplies will be visible to area residents, employees, and visitors, resulting in a short-term visual change. Visual changes as a result of construction activities are a common and accepted feature of the urban environment, and mitigation is generally not required. Nonetheless, the TJPA adopted the following mitigation measures to reduce aesthetics and visual impacts during construction:

- **VA 1 –** direct artificial lighting onto the work site at night to minimize "spill over" light or glare effects

- **VA 2** – make all efforts to minimize specific aesthetic and visual effects of construction identified by users of neighborhood businesses and residents

The 2004 FEIS/EIR concluded that construction-related aesthetic impacts will have a no adverse effect/ less-than-significant impact with the implementation of these mitigation measures.

Proposed Project

Because the proposed project components consist of Phase 2 refinements, other transportation improvements, and land development at or adjacent to elements of Phase 2 of the Transbay Program, the 2004 FEIS/EIR addressed nearly all of the visual quality and aesthetic impacts of the proposed project, and that discussion is hereby incorporated by reference (FTA 2004). The assessment below is, therefore, substantially similar to the 2004 FEIS/EIR, although more current information and analyses are incorporated to refine potential visual quality/aesthetic impacts for the proposed project component sites. Mitigation Measures VA 1 and VA 2, which were previously identified in the 2004 FEIS/EIR for the Transbay Program and have been adopted and incorporated into the project, would be implemented to address the visual quality and aesthetics impacts identified for the proposed project. The full text for the mitigation measures are presented in Appendix C of this SEIS/EIR.

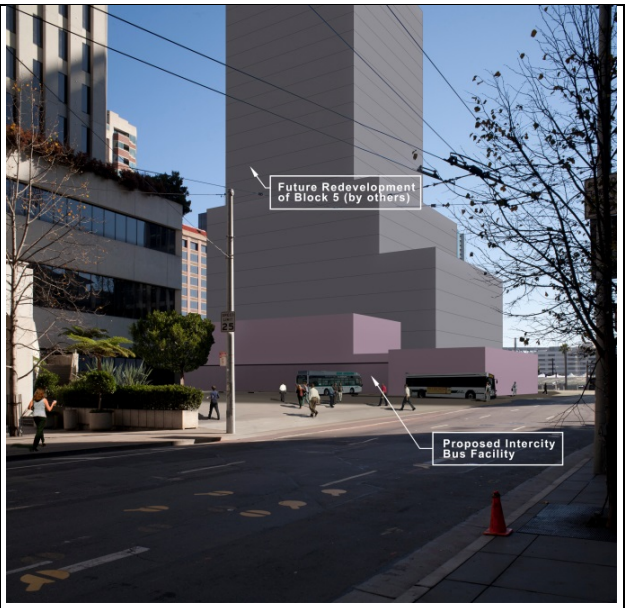
Certain proposed project components would be underground and, thus, would not be visible and have no effect on viewsheds, views, or visual quality: the widened throat structure, exhaust fans at the Transit Center, realigned Fourth and Townsend Street Station, tunnel box stub, rock dowels, bicycle/controlled vehicle ramp, and underground pedestrian connector. The additional trackwork along Seventh Street would be at-grade within the existing developed Caltrain right-of-way and would not be noticeable. In addition, the taxi staging area and AC Transit bus storage facility parking project components would not involve new construction or structures that could affect visual quality or aesthetics; the former would involve cars queued along the curbs and the latter would involve extended hours of parking operation of the previously approved parking facility. Consequently, none of these proposed project components is evaluated further in this section.

Impact VQ-1: The proposed project would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources. (No Adverse Effect/Less-than-Significant Impact)

The following analysis examines the proposed project components and their effects on scenic resources and vistas as identified in Section 3.5.2, Affected Environment. As noted previously, the adjacent land development is considered an indirect effect under NEPA and no CEQA significance conclusions are necessary pursuant to SB 743.

Intercity Bus Facility and Adjacent Land Development. The proposed intercity bus facility site is not visible in scenic views of downtown from I-80 (as shown in Figure 3.5-2), or from other scenic resources such as The Embarcadero and AT&T Park, due to intervening development. Similarly, easterly and southerly views of the San Francisco Bay are obstructed by mid-rise office and apartment buildings to the east, and the Bay Bridge approach to the south, as seen in Figure 3.5-9a. In addition, the intercity bus facility would be constructed within a city block directly to the east of the Transit Center across Beale Street. The intercity bus facility would appear as an extension of the Transit Center structure (Figure 3.5-9b, low rise, light gray building in the middleground). For context, a conceptual massing of a high-rise building that would comply with City development regulations, but is not a part of the proposed project, is provided in the background (shown as a darker gray building south of the intercity bus facility). The proposed intercity bus facility would not be discernible in views of downtown and would not obstruct scenic views, because it would be fully surrounded on all sides by taller buildings. The intercity bus facility is shown in Figure 3.5-9b. This two-story building would not alter scenic views of the San Francisco Bay looking south from Mission and Beale Streets because views of the San Francisco Bay are already obstructed by the Bay Bridge approach and low-rise development. As a result, this proposed project component would have a no adverse effect/less-than-significant impact on a scenic vista.

3.5-9a Existing Conditions
(Key Observation Point #17 in Figure 3.5-1)



3.5-9b Proposed Intercity Bus Facility in the Middleground and Future Cumulative Development by Others in the Background

Source: Created by Square One Productions 2014

Figures 3.5-9a–9b Visual Simulation of the Intercity Bus Facility

AT&T Park and The Embarcadero, which are approximately 4,000 and 1,000 feet from the intercity bus facility site, respectively, are not visible from the proposed intercity bus facility site. Therefore, the proposed intercity bus facility would not obstruct views to these resources and would have a no adverse effect/less-than-significant impact on a scenic resource.

The adjacent development would not obstruct scenic views of the San Francisco Bay because the view already is obstructed. Under NEPA, the adjacent development at the intercity bus facility site would have no indirect adverse effect on a scenic vista.

Fourth and Townsend Street Station Vent Structures. The proposed vent structures at the realigned Fourth and Townsend Street Station would introduce two structures that would occupy a footprint of less than 3,000 square feet each and extend approximately 35 feet above ground. The vent structures would not be visible when traveling on I-80 (see Figure 3.5-2) or when looking toward the site of these structures from the waterfront areas. Views of the San Francisco Bay from the site of the vent structures is blocked by a row of mid-rise apartment buildings located along King Street (see Figure 3.5-7b). The proposed vent structures would not be discernible in views to the San Francisco Bay and would not obstruct scenic views. This proposed project component would have a no adverse effect/less-than-significant impact on a scenic vista.

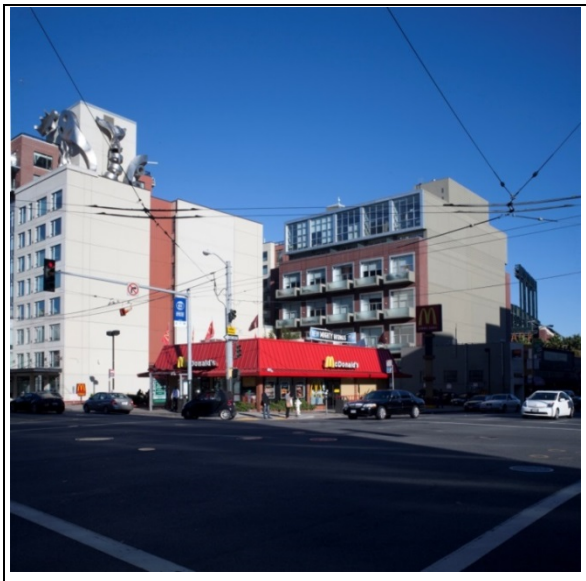
Views of AT&T Park and The Embarcadero, which are approximately 1,300 and 2,700 feet from the proposed project location, respectively, are blocked by intervening development. Therefore, the Fourth and Townsend Street Station vent structures would not obstruct views to these resources. Consequently, this project component would have a no adverse effect/less-than-significant impact on a scenic resource.

701 Third Street or Alternate Vent Structure Site at the Northeast Corner of Third and Townsend Streets and Adjacent Land Development. The proposed vent structure at 701 Third Street would occupy a portion of the site that currently contains a fast food restaurant (see Figure 3.5-8a). The base of the vent structure would occupy a rectangular footprint of approximately 3,600 square feet and raise two stories up to approximately 35 feet tall. The vent shaft would project above this base on a smaller footprint to 105 feet tall. The structure would be oriented along Townsend Street and adjacent to the building immediately to the east, leaving the Third Street frontage of the site available for future development (see Figure 3.5-10b).

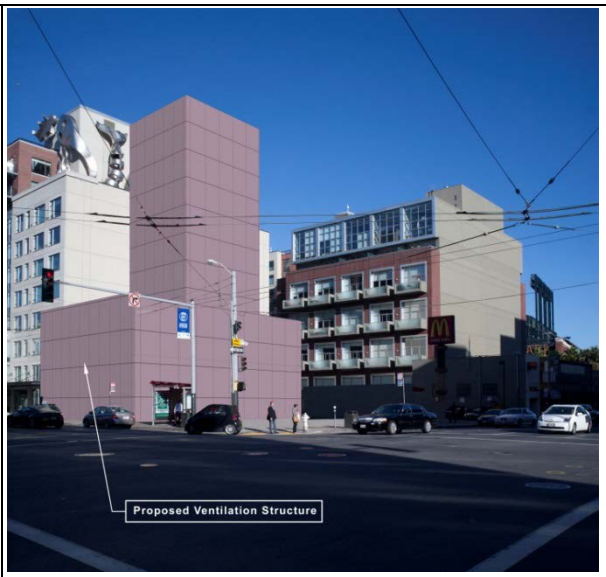
The alternate vent structure site at the northeast corner of Third and Townsend Streets would occupy a portion of the site that currently contains a liquor store and professional offices (see Figure 3.5-8c). The vent structure would occupy a footprint of approximately 4,000 square feet.

The proposed vent structure at both sites would not be visible from I-80 when traveling west; however, the visual simulation (Figures 3.5-10b and 3.5-10d) presents the height and general massing of the proposed development, demonstrating that a portion of the vent structures would be visible from AT&T Park, which is 450 feet away from the proposed project component site. The development could alter scenic views of the downtown skyline looking north from the intersection of King and Third Streets. However, views of the downtown skyline are mostly obstructed by intervening development; therefore, the proposed vent structure at 701 Third Street or the alternate site would not obstruct scenic views of downtown.

Vent structures at either site could alter scenic views of the San Francisco Bay looking south from Third and Townsend Streets. However, due to the relatively level topography of the area, views of the San Francisco Bay are already obstructed by the Third Street Bridge, and there is no other development that can be seen in the background when looking in this direction. Thus, this proposed project component would have a no adverse effect/less-than-significant impact on a scenic vista because the view is already partially obstructed.



3.5-10a Existing Conditions at 701 Third Street
(Key Observation Point #14 in Figure 3.5-1)



3.5-10b Proposed Project at 701 Third Street

3.5-10c Existing Conditions at Alternate Site

3.5-10d Proposed Project at Alternate Site

Source: Created by Square One Productions 2014

Figures 3.5-10a–10d Visual Simulation of Vent Structure at 701 Third Street and Alternate Site

The proposed vent structure sites are not visible from The Embarcadero, which is 1,300 feet away from the proposed project sites; however, portions of the sites are visible from AT&T Park at King and Third Streets. The proposed vent structures would be constructed at the east end of the sites, out of view from King and Third Streets. AT&T Park would continue to be visible from vantage points in the vicinity of the sites. Therefore, the proposed vent structures would have a no adverse effect/less-than-significant impact on a scenic resource.

The vent structures at 701 Third Street and the alternate site would occupy footprints of approximately 3,600 and 4,000 square feet, respectively, and the balance of each site would be available for adjacent development of approximately 72,000 square feet of mixed uses. The additional land development would not be visible from I-80 and would not result in additional obstruction of San Francisco Bay. The future land development adjacent to the vent structures would offer a continuous building façade along the sites' Third Street frontages. Under NEPA, the adjacent development at the 701 Third Street and alternative site would have no indirect adverse effect on a scenic vista.

Vent Structure at Second and Harrison Streets. The proposed vent structure at Second and Harrison Streets would introduce a vent structure that would occupy a footprint of approximately 2,100 square feet and be up to approximately 101 feet above grade. This site was evaluated in the 2004 FEIS/EIR for retail uses and 101 residential units at an allowable height of 85 feet. The vent structure would occupy a portion of this site, and the rest would be developed with the development program environmentally cleared by the 2004 FEIS/EIR. The vent shaft would project above its base on a smaller footprint up to approximately 101 feet tall. This would be 15 feet taller than the rest of the development at this site. The vent shaft would be narrow and would not be visible from I-80. As shown in Figure 3.5-2, the building in the foreground would block views to the site. The proposed vent structure would not alter or obstruct views of the downtown skyline from the freeway, and would have a no adverse effect/less-than-significant impact on a scenic vista.

AT&T Park and The Embarcadero, approximately 2,300 feet away from the site, are visible when looking southward from Second and Harrison Streets. Views of these scenic resources would not be obstructed because the proposed development would not extend above the existing adjacent buildings. The proposed vent structure would have a no adverse effect/less-than-significant impact on a scenic resource.

Transit Center Vent Structures. The proposed vent structure at Second and Natoma Streets would be constructed within the footprint of the Transit Center previously evaluated in the 2004 FEIS/EIR, and the proposed vent structure at Natoma and Main Streets would be constructed and contained within the intercity bus facility. The intercity bus facility was discussed earlier. The Transit Center vent structures would not adversely affect scenic views or resources.

The 2004 FEIS/EIR determined that the Transit Center would not have an adverse effect/significant impact on existing views given the scale of existing development surrounding the project area. Because the footprint for the vent structure at Second and Natoma Streets was previously cleared for construction at the Transit Center, the changes associated with this proposed project component, which are generally within the same building envelope as the previously approved development, would likewise not have an adverse effect/significant impact. In addition, AT&T Park and The Embarcadero are 4,000 feet and 1,000 feet away from the Transit Center, respectively, and would not be visible from the proposed vent structure, and the proposed vent structure would not be visible from these locations. As a result, the proposed vent structure would have a no adverse effect/less-than-significant impact on scenic views and would not cause substantial damage to scenic resources within the surrounding area.

Impact VQ-2: The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings. (No Adverse Effect/Less-than-Significant Impact)

The following analysis examines the proposed project components and their effects on the visual character of their surroundings, including changes to urban form and the scale of development. As noted previously, the adjacent land development would be considered an indirect effect under NEPA and no CEQA significance conclusions are necessary pursuant to SB 743.

Intercity Bus Facility and Adjacent Land Development. The proposed intercity bus facility would introduce a new two-story, 40-foot-tall structure at the back (south side) of the 201 Mission Street office tower, replacing a construction staging area, surface parking, three levels of office, and landscaped open areas (Figure 3.5-5e). The uses around the intercity bus facility site largely consist of office use, with some residential uses directly to the south (Figure 3.5-9a). Commuters and users of the businesses in the area would be considered to be low to moderate sensitive viewers, and residents would be highly sensitive viewers in this area. The site currently has a low to moderate aesthetic value due to its use for parking and construction staging, office space, and landscaped open areas.

The visual simulation (Figure 3.5-9b) depicts the height and bulk of the intercity bus facility and future cumulative development by others in the background. As depicted in Figure 3.5-9b, the intercity bus facility would be substantially shorter than the surrounding development, but would not result in a substantial contrast in scale or the visual context of development pattern in the vicinity. The ground level of the intercity bus facility would include retail opportunities along Beale Street and Main Street that would enhance continuity along the street and encourage pedestrian activity, which currently has a low to moderate aesthetic value. Furthermore, the building and the proposed taxi staging along Natoma Street would increase pedestrian activity with passenger loading, unloading, and waiting, which would further activate the pedestrian environment. The building that is shown immediately south of the intercity bus facility in Figure 3.5-9b illustrate the height and massing that would be allowable by the TCDP. Although this building may appear to be part of the same structure in the simulation, this building is set farther back and is not a component of the proposed project, but is included in the visual simulation to demonstrate the maximum size and scale of a tower that could be developed on the site by another owner in accordance with the TCDP, immediately south of the intercity bus facility. The intercity bus facility would be designed to be compatible with the previously approved Transit Center and would be developed in accordance with the Transbay Program and TCDP, which strives to improve the pedestrian realm by providing active uses within the ground-level interface of buildings. Therefore, the visual effect of the proposed intercity bus facility and its retail opportunities at ground level would be positive, and development of the intercity bus facility would have a no adverse effect/less-than-significant impact on sensitive viewers and on the existing visual character and quality and scale of the site and its surroundings.

Future office or residential development at this site could include up to two additional levels for office or residential development, bringing the building height to a maximum of 75 feet. Even with the additional land development, the development at this site would remain substantially shorter than the surrounding development, and it would be in accordance with the Transbay Program and TCDP. Under NEPA, the adjacent land development at the intercity bus facility site would have no indirect adverse effect on visual character and quality.

Fourth and Townsend Street Station Vent Structures. The proposed Fourth and Townsend Street Station vent structures would consist of two structures approximately 35 feet tall along the northern edge of the Caltrain railyard, fronting onto Townsend Street. This area is a mixed-use of residential, office, and commercial uses. Commuters and users of the businesses in the area would be considered to be low to moderate sensitive viewers, and residents would be highly sensitive viewers. The existing Caltrain railyard itself is a well-defined edge for the project area. The vent structures would be contained within

the railyard fencing and adjacent to sidewalks. The railyard is already developed and industrial in nature. The vent structures would not introduce elements that are out of context with railyards or train stations, and the structures would not be located in the immediate vicinity of the surrounding apartment and commercial buildings. The proposed vent structures would not result in a noticeable change at the proposed project site and, therefore, would have a no adverse effect/less-than-significant impact on sensitive viewers and on the visual quality, character, and scale of the site and its surroundings.

Vent Structures at 701 Third Street or Alternate Site (and adjacent land development). The proposed vent structure at 701 Third Street would replace a fast food restaurant and parking lot; a liquor store and professional offices would be replaced at the alternate site. This area is a mix of residential, office, and commercial uses. Commuters and users of the businesses in the area would be considered to be low to moderate sensitive viewers, and residents would be highly sensitive viewers. Figures 3.5-10a through 3.5-10d show the existing view and a visual simulation of the proposed vent structure at 701 Third Street and the alternate site. The simulation demonstrates that the vent structure would be taller than the adjacent buildings, but would be similar in bulk. Because the adjacent buildings and the mid-rise apartment building (see Figure 3.5-8b) across Third Street have contemporary designs and rectilinear features, the proposed vent structures would not substantially alter the character of the area. Furthermore, the existing fast food restaurant, liquor store, and professional offices do not significantly contribute to the visual quality or character of the neighborhood.

Because the vent structure would have a contemporary design, these proposed project components would not substantially alter the character of the neighborhood, which currently does not have a high level of cohesiveness or visual definition, nor would it result in a substantial contrast in scale or visual context. Therefore, the proposed vent structure at either site would have a no adverse effect/less-than-significant impact on sensitive viewers and on the visual quality, character, and scale of the site and its surroundings.

Like the vent structures, the additional land development would have comparable bulk to adjacent buildings and would have a contemporary design. Under NEPA, the adjacent development at the 701 Third Street and alternate site would have no indirect adverse effect on visual character and quality.

Vent Structure at Second and Harrison Streets. The proposed vent structure at Second and Harrison Streets would be a maximum of 101 feet tall. This area consists of office and residential uses. Commuters and users of the businesses in the area would be considered to be low to moderate sensitive viewers, and residents would be highly sensitive viewers. Currently, the site is a paved lot that is used for parking. The surrounding built environment does not exhibit distinctive patterns or notable visual attributes, or contribute to an active pedestrian realm. As a result, the site is considered to have low visual quality. The site was previously analyzed in the 2004 FEIS/EIR as part of the Transbay Redevelopment Project Area for development of 121,500 square feet or 101 residential units. The massing associated with this maximum development envelope is shown in Figure 3.5-11b. The vent structure would be a new addition to the site, and would appear different from the adjacent buildings and would alter the character of the site and its surroundings. Figure 3.5-11a and Figure 3.5-11b provide an existing photo of this proposed project component site and a visual simulation that demonstrates that the proposed vent structure would extend approximately 15 feet above the approved development at the site. However, the vent shaft would project above the building on a smaller footprint than its base, resulting in a narrow shaft and would not appear to extend substantially over the approved development at the site. The proposed vent structure would not result in a substantial contrast in scale. In addition, buildings across Second Street have contemporary designs; therefore, the vent structure's contemporary design would be compatible and would not substantially degrade the visual character of the area. Since the site currently has low visual quality, the additions to the site would not represent an adverse effect/impact on existing conditions. Therefore, the proposed vent structure would have a no adverse effect/less-than-significant impact on sensitive viewers and on the visual quality, character, and scale of the site and its surroundings.

3.5-11a Existing Conditions

3.5-11b Proposed Project

Source: Created by Square One Productions 2014

Figures 3.5-11a-11b Visual Simulation of Vent Structure at Second and Harrison Street

Transit Center Vent Structures. The proposed vent structure at Second and Natoma Streets would be constructed within the footprint of the Transit Center previously evaluated in the 2004 FEIS/EIR. The footprint for the vent structure at Second and Natoma Streets has already been cleared as part of Phase 1 of the Transbay Program, and the 2004 FEIS/EIR determined that the Transit Center would not have an adverse effect/impact on the visual quality or character of the area. The proposed vent structure at Natoma and Main Streets would be constructed and contained within the intercity bus facility. The intercity bus facility was discussed earlier, and it was determined that it would not adversely affect the visual quality or character of the surrounding area.

The addition of the vent structure would have a no adverse effect/less-than-significant impact on sensitive viewers and on the visual quality, character, and scale of the site and its surroundings.

Implementation of Mitigation Measure VA 2, which was previously identified in the 2004 FEIS/EIR and was adopted and incorporated into the approved Transbay Program, would serve to minimize aesthetic and visual effects of construction.

Impact VQ-3: The proposed project could create a new source of substantial light or glare, but it would not adversely affect day or nighttime views in the area. (No Adverse Effect/Less-than-Significant Impact)

The following analysis examines the proposed project components and their effects on ambient light and glare and the potential changes that could affect views and visibility. As noted previously, the adjacent land development is considered an indirect effect under NEPA and no CEQA significance conclusions are necessary pursuant to SB 743.

Intercity Bus Facility and Adjacent Land Development. The proposed intercity bus facility would introduce a new structure on a site that is currently used for parking and construction staging, and is

partially occupied by the 201 Mission Street podium structure that contains a series of balconies. Windows in the proposed buildings would be a new potential source of glare added to the project site during the daytime; however, Planning Commission Resolution 9212 prohibits the use of mirrored or reflective glass in new buildings (City of San Francisco 2012). Therefore, effects related to glare would not be substantial, and there would be a no adverse effect/less-than-significant impact on glare.

The intercity bus facility would increase the amount of light emitted from the site, including LED controlled lighting to serve arriving and departing buses and their passengers. New exterior lighting fixtures would also be located at building entrances and along pedestrian walkways as necessary to provide safety and security. The type of lighting anticipated for the development would be typical for this urban area of San Francisco, which has a concentration of tall buildings and, thus, has the greatest intensity of night lighting sources in the City (City of San Francisco 2012). The addition of lighting would be necessary for users of the intercity bus facility. The DTX Design Criteria, summarized in Chapter 2, Project Alternatives, contains a number of measures to prevent spillover light in the direction of neighboring residential and commercial properties, which include providing lower light levels, selecting appropriate luminaries, and shielding. Light sources would be chosen with shielding and would be located to prevent light spill and glare in the direction of neighboring residential or commercial properties, and care would be exercised to prevent specular reflection on signage, direct glare from exposed lamps, brightness areas of individual fixtures, and reflections on glazing or other similar surfaces (TJPA, PMPC 2009). Therefore, the intercity bus facility would have a no adverse effect/less-than-significant impact related to light and glare.

The future office or residential development at this site also would be subject to Planning Commission Resolution 9212 and other applicable standards. Under NEPA, the adjacent land development at the intercity bus facility would have no indirect adverse effect related to light and glare.

Fourth and Townsend Street Station Vent Structures. The proposed vent structures at the Fourth and Townsend Street Station would potentially create new sources of light or glare because they would be about 35 feet tall and would contain exterior lighting fixtures for the emergency exits from the underground tunnel. The vent structures would not contain mirrored or reflective glass, pursuant to Planning Commission Resolution 9212; as a result, they would not adversely affect/impact daytime glare in the area. Likewise, new sources of light from the vent structures would serve to light the vent structure exit for safety and security purposes. Given that the site and surrounding area are developed, the proposed vent structures would not introduce external lighting that would be out of the ordinary for densely populated urban environments. Therefore, the proposed vent structures would have a no adverse effect/less-than-significant impact related to light and glare.

Vent Structure at 701 Third Street or Alternate Site (and adjacent land development). The proposed vent structure heights at 701 Third Street or the alternate site would be consistent with City zoning. These structures would be required to comply with Planning Commission Resolution 9212, which prohibits the use of mirrored or reflective glass, and therefore would not adversely affect/impact daytime glare in the area. The proposed development at either site would increase the amount of light emitted from the site, including light emitted from uses within the proposed building, and exterior lighting fixtures for the building entrance(s) and along the sidewalk for safety and security. However, the surrounding area is already highly developed, and the new sources of light would not be out of the ordinary for densely populated urban environments. Therefore, the proposed vent structure at 701 Third Street or the alternate site would have a no adverse effect/less-than-significant impact related to light and glare.

The future mixed-use development also would be subject to Planning Commission Resolution 9212 and other applicable standards. Under NEPA, the adjacent land development at the intercity bus facility would have no indirect adverse effect related to light and glare.

Vent Structure at Second and Harrison Streets. The proposed vent structure at Second and Harrison Streets would be up to 101 feet tall. Because the site is currently used as a parking lot (see Figure 3.5-11a), the proposed vent structure shown in Figure 3.5-11b would increase the amount of light emitted from the site to provide exterior lighting fixtures for the building entrance(s) and along the sidewalk for safety and security. The development would not contain mirrored or highly reflective materials, pursuant to Planning Commission Resolution 9212; therefore, the development would not have an adverse effect/impact related to glare. The area is highly developed, and the new sources of light would not be out of the ordinary for a densely populated urban environment. Therefore, the proposed vent structure and adjacent development would have a no adverse effect/less-than-significant impact related to light and glare.

Transit Center Vent Structures. The proposed vent structure at Second and Natoma Streets would be constructed within the footprint of the Transit Center that was previously evaluated and approved in the 2004 FEIS/EIR. The proposed vent structure at Natoma and Main Streets would be constructed and contained within the intercity bus facility. The intercity bus facility was discussed earlier; therefore, the vent structure at Natoma and Main Streets will not be discussed further as it relates to light and glare.

The proposed vent structure at the western end of the train box would be located within the Transit Center footprint and envelope. The impact related to light and glare due to the Transit Center was analyzed and approved in the 2004 FEIS/EIR, which determined that there would be a no adverse effect/less-than-significant impact due to additional light and glare.

Implementation of Mitigation Measure VA 1, which was previously identified in the 2004 FEIS/EIR and was adopted and incorporated into the approved Transbay Program, would reduce impacts from spill over light and glare during construction.

Cumulative Analysis

Impact CU-VQ-4: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on aesthetics and visual quality. (No Adverse Effect/Less-than-Significant Impact)

For this SEIS/EIR, the potential aesthetic impacts of the proposed project were considered in conjunction with the potential environmental impacts of buildout of other projects planned and proposed within the vicinity of the proposed project, including TCDP, Transbay Redevelopment Plan, Central SoMa, East SoMa, and Mission Bay North areas. Views and vistas of the proposed project would be seen from different vantage points around the City, but the proposed project components that are different from those analyzed in the 2004 FEIS/EIR may not be noticeable from some locations because of the density of development in those proposed project areas.

Buildout of the cumulative study area would occur in accordance with the TCDP; Transbay Redevelopment Plan; and the Central SoMa, East SoMa, and Mission Bay North Plans, which would increase the density of development and increase height limits of specific sites. As a result, development under these plans would result in an overall change in visual character of the northeast portion of the City, and would modify short- and long-range public views of the downtown skyline. The cumulative projects would intensify development of the area. These projects would be required to comply with the General Plan and applicable urban design controls included in the plans, which include policies that require maximizing retention of existing views and resources. As a result, the cumulative visual impacts would be not adverse/less than significant.

The 2004 FEIS/EIR determined that the Transbay Program will not have the potential to result in cumulative aesthetic impacts. The proposed project components would result in the introduction of new structures at the sites, but they would be developed in accordance with the General Plan and above-mentioned area plans. In addition, as described above, the proposed project components would not obstruct scenic views, damage scenic resources, or degrade the visual character or quality of the component sites or their surroundings. Therefore, the cumulative impacts related to visual quality and aesthetics would be not adverse/less than significant.

Impact CU-VQ-5: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative light and glare impacts. (No Adverse Effect/ Less-than-Significant Impact)

Buildout of the proposed project area would occur in accordance with the TCDP; Transbay Redevelopment Plan; and Central SoMa, East SoMa, and Mission Bay North Plans, which would increase the density of development. The cumulative projects would generate additional night lighting, but the change is not anticipated to be substantial and would not be in excess of what is expected in an urban environment. Cumulative new development could also be expected to incrementally reduce night lighting on a per-building basis with the ongoing focus on energy conservation (City of San Francisco 2012). The cumulative projects would be required to comply with Planning Commission Resolution 9212; therefore, cumulative impacts related to light and glare would be not adverse/less than significant.

3.5.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Visual Quality / Aesthetics (Not Adverse)	The 2004 FEIS/EIR concluded that although new buildings would alter visual character, quality, and light and glare, the long-term visual changes would not be adverse. Construction-related visual effects would be reduced with Mitigation Measures VA 1 and VA-2, previously adopted and incorporated into the Program. The proposed project analyzed in this SEIS/EIR would not introduce new adverse visual quality/aesthetic effects. Therefore, the proposed project would not result in any new adverse effects not identified in the 2004 FEIS/EIR or change the effects in the 2004 FEIS/EIR. No additional mitigation measures beyond those adopted in the 2004 FEIS/EIR, and incorporated into the Transbay Program for construction-related effects would be required for the proposed project.
CEQA Summary	
Impact VQ-1: Scenic Vista and Scenic Resources (Less than Significant)	The 2004 FEIS/EIR concluded that because the Transbay Program would employ setbacks and create a regular streetscape at the ground level, and because the scale of existing development surrounding the project area would obstruct most views of the new development, a less-than-significant impact would occur on existing scenic views. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact on scenic vistas or scenic resources. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact VQ-2: Visual Character and Quality (Less than Significant)	The 2004 FEIS/EIR concluded that although the Transbay Program would be expected to alter the existing aesthetic character of the area, the visual features that would be introduced are commonly accepted in urban areas and would not substantially degrade the existing visual quality or obstruct publicly accessible views, thus resulting in a less-than-significant impact on visual quality. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact on visual character, quality, and scale. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond Mitigation Measure VA 2 adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program for construction-related visual effects would be required for the proposed project.

Impact VQ-3: Light and Glare (Less than Significant)	The 2004 FEIS/EIR concluded that although new buildings would generate additional night lighting and new buildings and vehicles would produce additional glare, the visual features that would be introduced are commonly accepted in urban areas and would not generate obtrusive light or glare, thus resulting in a less-than-significant impact related to light and glare. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts related to light and glare. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond Mitigation Measure VA 1 adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program for construction-related effects would be required for the proposed project.
Impact CU-VQ-4: Cumulative – Aesthetics and Visual Quality (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative visual quality/aesthetic impacts. The proposed project would not change the cumulative effects conclusions in the 2004 FEIS/EIR.
Impact CU-VQ-5: Cumulative – Light and Glare (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative light and glare impacts. The proposed project would not change the cumulative effects conclusions in the 2004 FEIS/EIR.

3.6 HISTORIC AND CULTURAL RESOURCES

3.6.1 Introduction

This section describes the cultural resources in the project area of potential effects (APE), defined as an area within which the proposed project could have a direct or indirect effect on architectural or archaeological resources. This evaluation was completed to ensure compliance with NEPA, Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended, and CEQA. NEPA, the NHPA, and CEQA require federal, state, and local agencies to identify environmental impacts that may affect historical resources.

The 2004 FEIS/EIR (FTA 2004a) contains a review of the environmental, historical, and archaeological setting of the Transbay Program. Since that document was completed, other architectural and archaeological studies relevant to the APE have been prepared. Those studies, which are described in detail in the following sections, were consulted to gather information specific to the proposed project components. The studies present findings that both confirm and refine an understanding of the historic built environment and archaeological sensitivity within and in the immediate vicinity of the proposed project footprint.

This section also describes existing paleontological resources within the proposed project corridor and immediate vicinity. Paleontological resources are defined in the Paleontological Resources Preservation Act of 2009 as "any fossilized remains, traces, or imprints of organisms preserved in or on the Earth's crust that are of paleontological interest and that provide information about the history of life on Earth." Further, fossils are nonrenewable paleontological resources that are afforded protection by federal, state, and local environmental laws and regulations. A paleontologically important rock unit is one that has a high potential paleontological productivity rating and is known to have produced unique, scientifically important fossils. Although CEQA itself does not define "unique paleontological resource," its definition for a "unique archaeological resource" is relevant. A unique resource must meet any of the following criteria as defined in PRC Section 21083.2(g): (1) contain information needed to answer important scientific research questions and there is demonstrable public interest in that information, (2) has a special and particular quality such as being the oldest of its type or the best example of its type, and/or (3) is directly associated with a scientifically recognized important prehistoric or historic event.

3.6.2 Affected Environment

Overview to Prior Consultation with the State Historic Preservation Officer

As part of the 2004 FEIS/EIR, Section 106 consultation was initiated with the State Historic Preservation Officer (SHPO) in 2001, which included the delineation of an APE that included 149 parcels. Those studies identified 122 buildings, 46 of which were properties that were determined eligible or appeared eligible for listing on the NHRP. Three historic districts, The South End Historic District, the Second and Howard Streets Historic District, and the New Montgomery-Second Street Conservation District, were identified in the APE. Five prehistoric archaeological sites were documented within the APE and 19 known or potential historic-era archaeological sites were identified within or immediately adjacent to the APE (JRP 2001; Peninsula Corridor Joint Powers Board 2003). A Finding of Effect (FOE) was prepared and was transmitted to the SHPO on August 29, 2003; the SHPO concurred with the FOE on November 25, 2003. A Memorandum of Agreement (MOA) was signed by FTA, SHPO, TJPA, City and County of San Francisco, Peninsula Corridor Joint Powers Board, and California Department of Transportation in June 2004. Copies of these letters are available in Appendix D of the 2004 FEIS/EIR. Since then, six addenda to the 2004 FEIS/EIR have been adopted. The MOA was amended in 2010, to add FRA and TJPA as signatories. The proposed project consists largely of refinements to the approved Transbay Program. Consequently, FTA is consulting with the SHPO.

Formal consultation with the SHPO for the supplemental Section 106 studies began in July 2015, and a letter from FTA to the SHPO asking for concurrence on the APE Amendment and Supplemental Section 106 report was transmitted in September 2015. Concurrence from SHPO was received on December 8, 2015 (see Appendix G.1).

Methods for Identifying Historic and Paleontological Properties in the Proposed Project APE

The 2004 FEIS/EIR contains a review of ethnographic, historical, and archaeological literature that was available at the time of its approval. For this SEIS/EIR, the FOE information was supplemented with development of updated APEs specific to the proposed project, as well as review of archival materials at the Northwest Information Center (NWIC) at Sonoma State University and the Sacred Lands File with the Native American Heritage Commission (NAHC) to identify investigations in the study area that occurred after 2004. The updated APEs and research are detailed in the Section 106 report that was submitted to the SHPO for concurrence; the updated APEs are reproduced as Figure 3.6-1, Figure 3.6-2, and Figure 3.6-3 in this section of the SEIS/EIR.

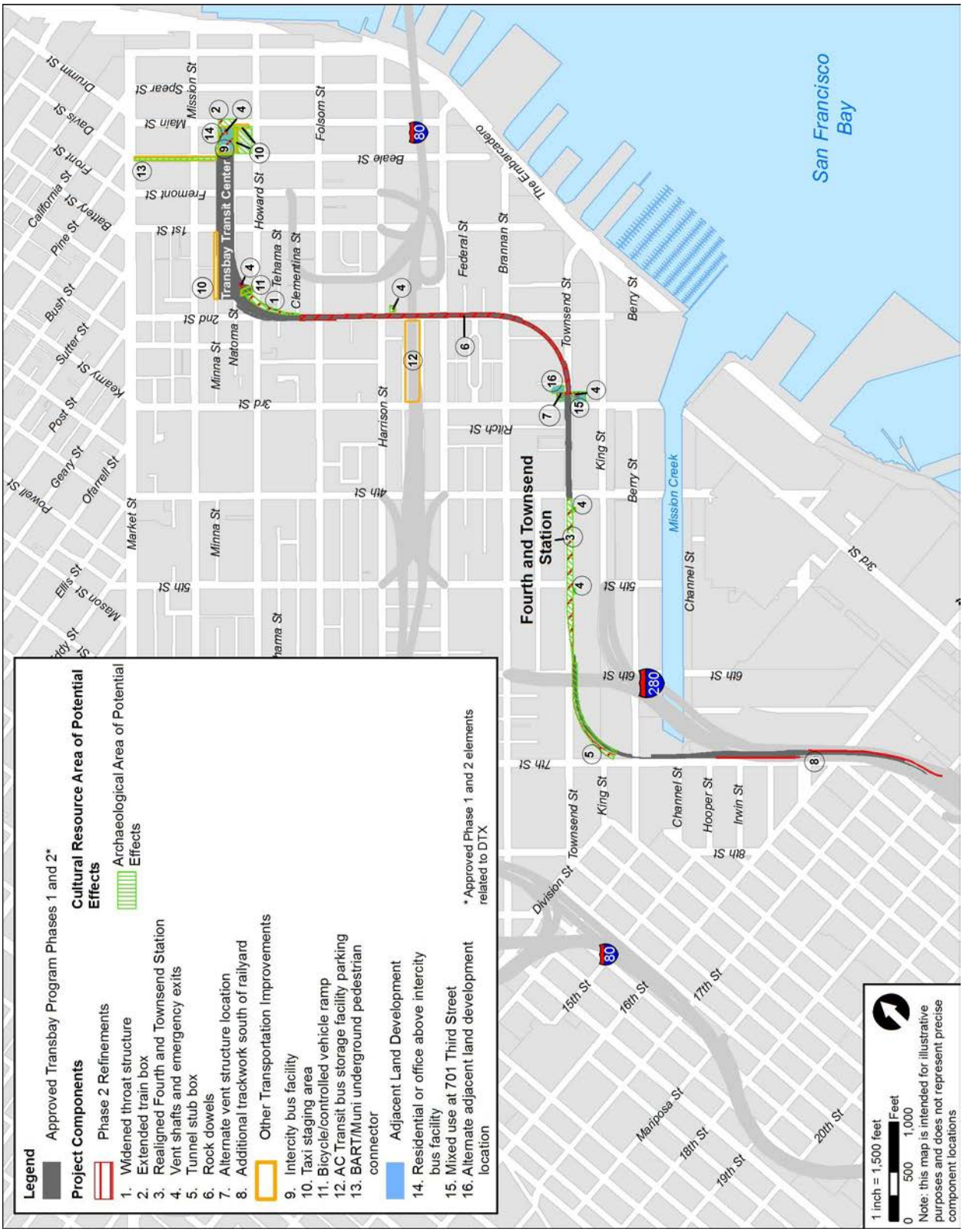
No additional architectural field survey was undertaken as part of this evaluation because all portions of the Architectural APE have been surveyed recently (see "Documented Architectural Results" section, below). No archaeological field survey was conducted because such survey is not feasible due to the degree of urban development and lack of exposure or access to native soil.

For paleontological resources, geologic maps and reports of the proposed project area and surrounding region were reviewed to determine the exposed rock units and soil characteristics. In addition, review of published and unpublished geological and paleontological literature assisted in documenting the number and locations of previously recorded fossils. This review was supplemented by an archival search conducted at the University of California Museum of Paleontology in Berkeley, California (UCMP 2014). Because the ground surface was obscured by existing structures and pavement, a reconnaissance-level field survey for paleontological resources was not performed.

Archaeology

Area of Potential Effects

The Archaeological APE for the proposed project is defined as all areas that may experience ground disturbance as a result of construction of the proposed project components. The Vertical APE comprises the below-grade extent of ground-disturbing activities, developed for the purpose of analyzing the potential for encountering archaeological resources during project construction. The Vertical APE shows the maximum depth of disturbance for each of the relevant proposed project component footprints, and the current understanding of the geological and cultural strata that lie within the areas to be disturbed. The depth of anticipated ground disturbance and the underlying geologic layers are based on information summarized in Section 3.9, Geology, Soils, and Seismicity, of this SEIS/EIR. The APE conforms to the methods used to establish the Archaeological APE for the Transbay Program as delineated by the Federal Transit Administration (FTA) in 2001 in consultation with the SHPO. As explained in the 2004 FEIS/EIR, the entire APE, which is more expansive than the APE for the changes that constitute the proposed project, is covered by buildings or pavements, as well as great depths of artificial fill. Thus, it was not, and still is not, possible to determine the locations of archaeological sites that may be affected by construction without extensive fieldwork. To address the potential to encounter historic resources, the TJPA has prepared, in accordance with the 2004 MOA, Archaeological Research Design and Treatment Plans for various work sites as construction plans are approved.



Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-1 Horizontal Archaeological APE

For the proposed project, the horizontal Archeological APE is shown in Figure 3.6-1 and the vertical Archaeological APE is shown in Figure 3.6-2a through 3.6-2f. A letter from FTA requesting SHPO concurrence with the archaeological and architectural Areas of Potential Effect and the identification of historic resources was submitted to SHPO on September 11, 2015 (see Appendix G.1). SHPO concurrence on the APEs and inventory of historic resources was received on December 8, 2015 (see Appendix G.1). The proposed project components that would necessitate intensive ground disturbance during construction would include the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, vent structures, the tunnel stub box, and the BART/Muni underground pedestrian connector. No further consideration of the other components of the proposed project (i.e., the bicycle/controlled vehicle ramp, the installation of rock dowels, the additional trackwork south of the Caltrain railyard, the intercity bus facility, taxi staging area, and AC Transit bus storage parking area) was made for the archaeological resources impact assessment, because they either would not involve ground disturbance during construction or would involve areas already disturbed. Therefore, these components would have no potential to disturb archaeological resources.

Sacred Lands

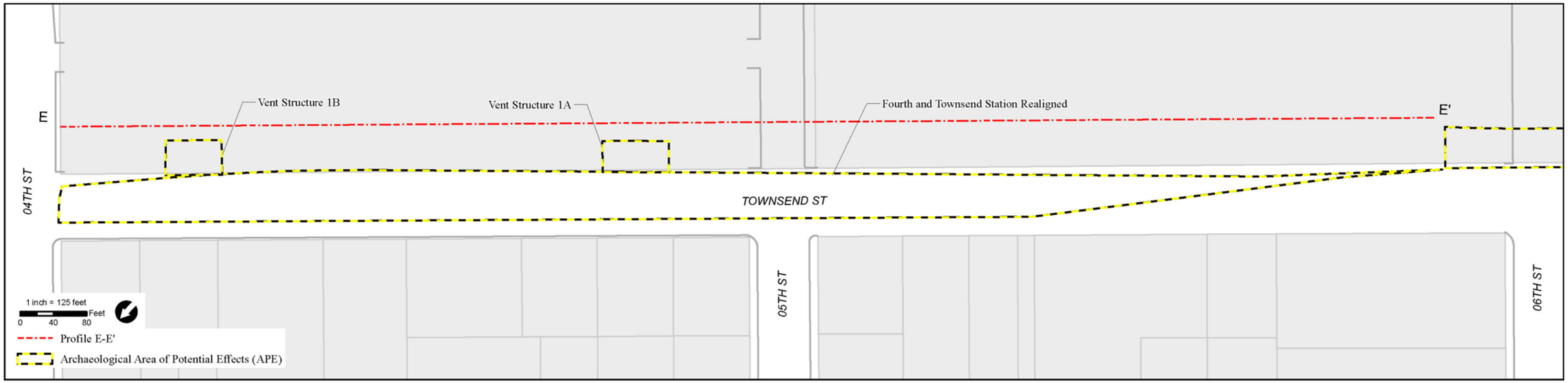
A review of the Sacred Lands File by the NAHC staff in September 2013 did not identify specific information concerning the Archaeological APE. The NAHC provided a list of groups and individuals who could have an interest in the project area. The Native American groups and individuals identified by the NAHC were contacted to request information or concerns regarding the project. As of July 2015, seven of the nine individuals on the list provided by the NAHC have been successfully contacted, and two of those individuals have requested that a Native American monitor be present during project construction. No new information on cultural resources within the APE was provided as a result of this consultation. Under Section 106 of the NHPA, FTA, as the lead federal agency, is responsible for consulting with federally recognized tribes.

Documented Archaeological Resources

After certification of the 2004 FEIS/EIR, and in compliance with the Section 106 MOA between the FTA and the California SHPO regarding the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, which was executed in 2004 and amended in 2009, the TJPA developed and implemented a series of Archaeological Research Design and Treatment Plans (ARDTPs) for the components of Phase 1 of the Transbay Program that have gone, or will be going, to construction (FTA 2004b). In 2012, the City certified the Transit Center District Plan and Transit Tower FEIR (City of San Francisco 2012a), which contains historical and cultural resources analyses pertinent to the northern half of the proposed project components. In addition, the San Francisco Municipal Transportation Agency conducted the Central Subway archaeological studies (Anthropological Studies Center 2010, 2011). These studies are pertinent to the Downtown Rail Extension (DTX) alignment between Townsend and Second Streets. Their findings both confirm and refine the understanding of the archaeological sensitivity within and in the immediate vicinity of the Transbay Program footprint that was originally disclosed in the 2004 FEIR/EIR.

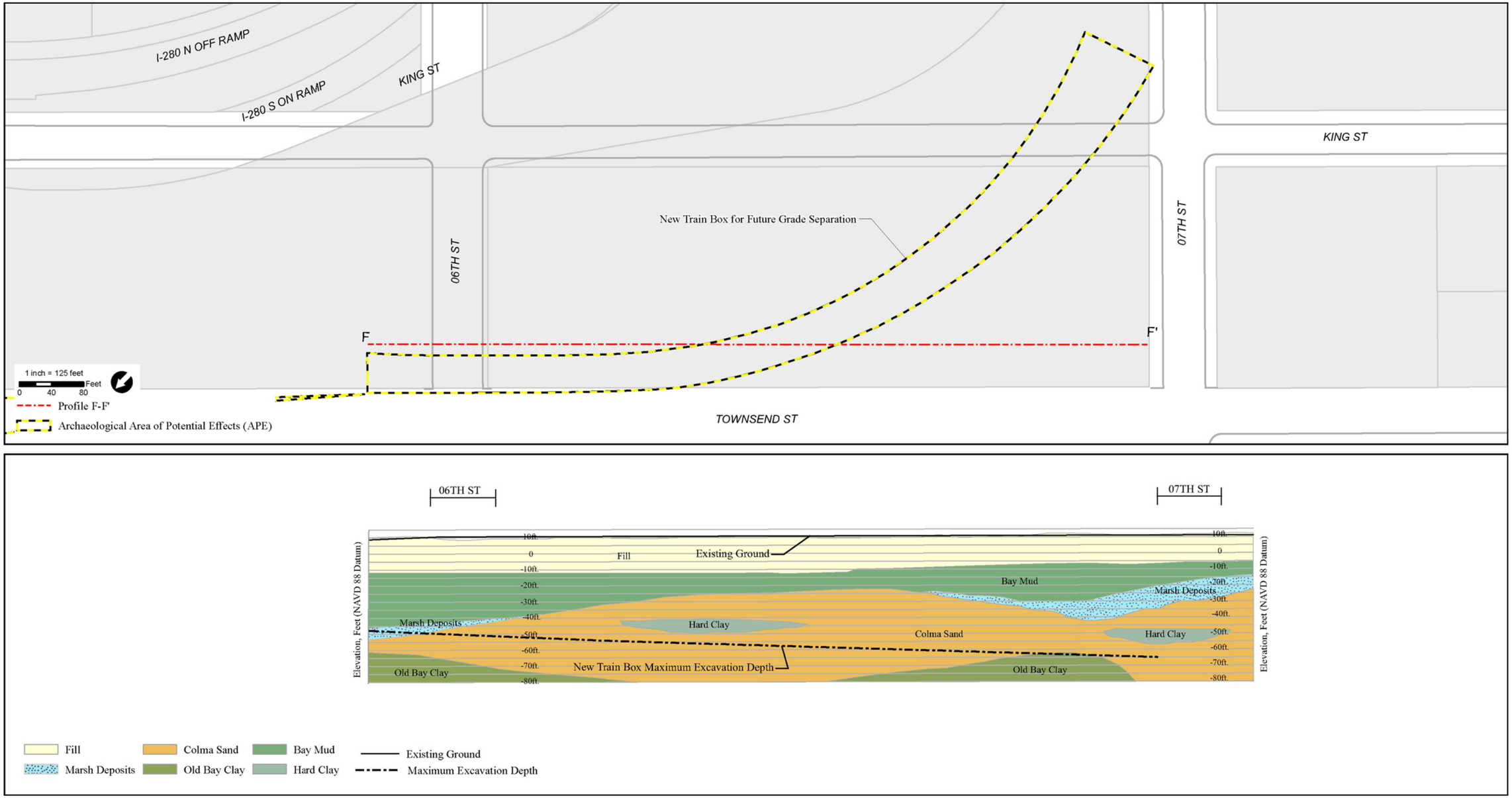
Other relevant archaeological studies of the South of Market district that were consulted for the 2004 FEIS/EIR were revisited for information specific to the proposed project components. These include the SF-480 Terminal Separation Rebuild Project and the San Francisco–Oakland Bay Bridge (SFOBB) West Approach Replacement Project. Results of the archaeological investigations were revisited for their potential applicability to the Archaeological APE for the proposed project.

The records search completed by the NWIC staff (File No. 13-0287) in September 2013 revealed that two archaeological sites have been recorded within or near the proposed project Archaeological APE: CA-SFR-151/H and CA-SFR-152H.



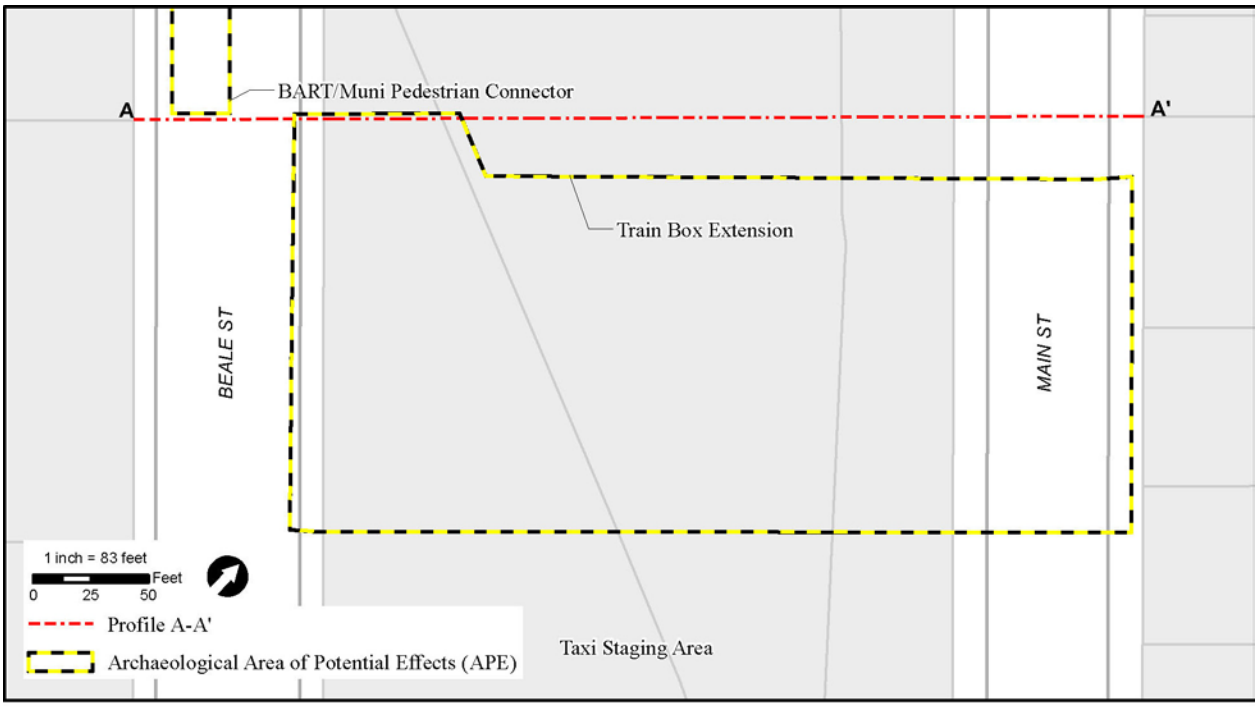
Sources: Created by William Self Associates 2014

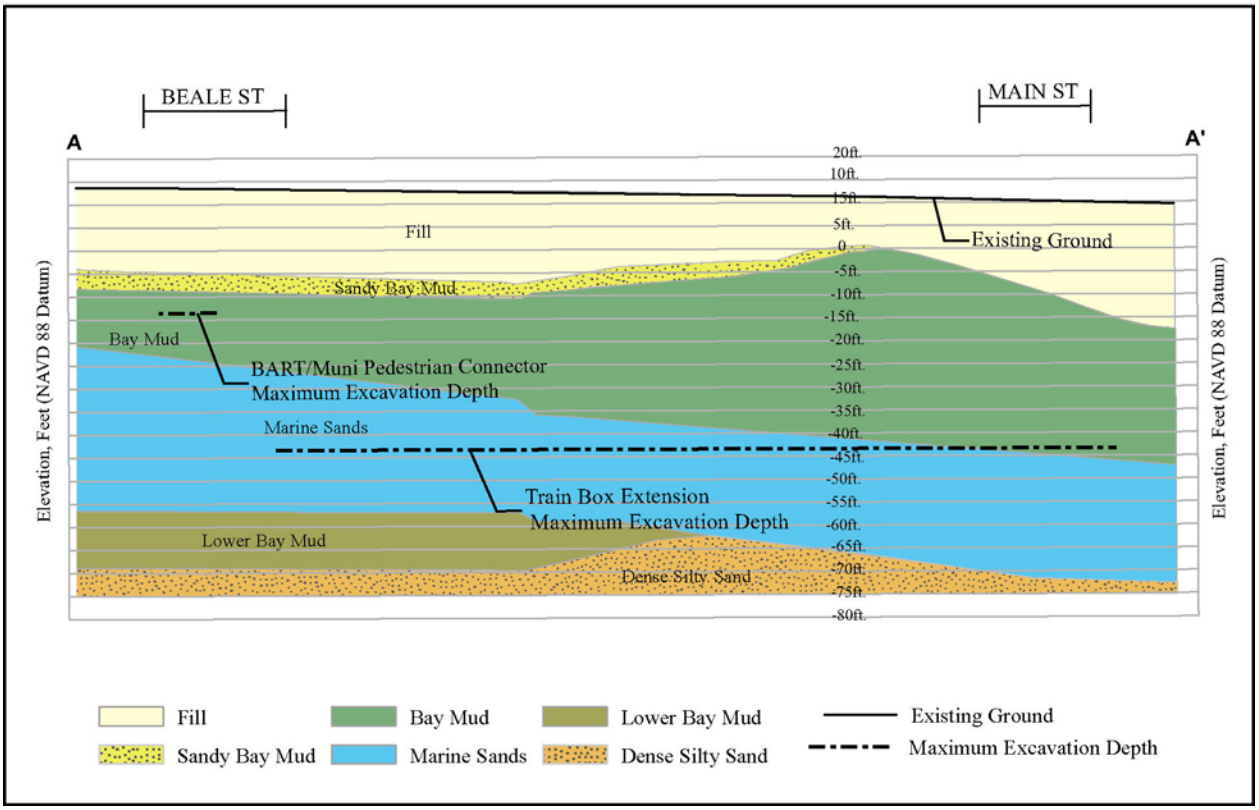
Figure 3.6-2a Vertical Archaeological APE



Sources: Created by William Self Associates 2014

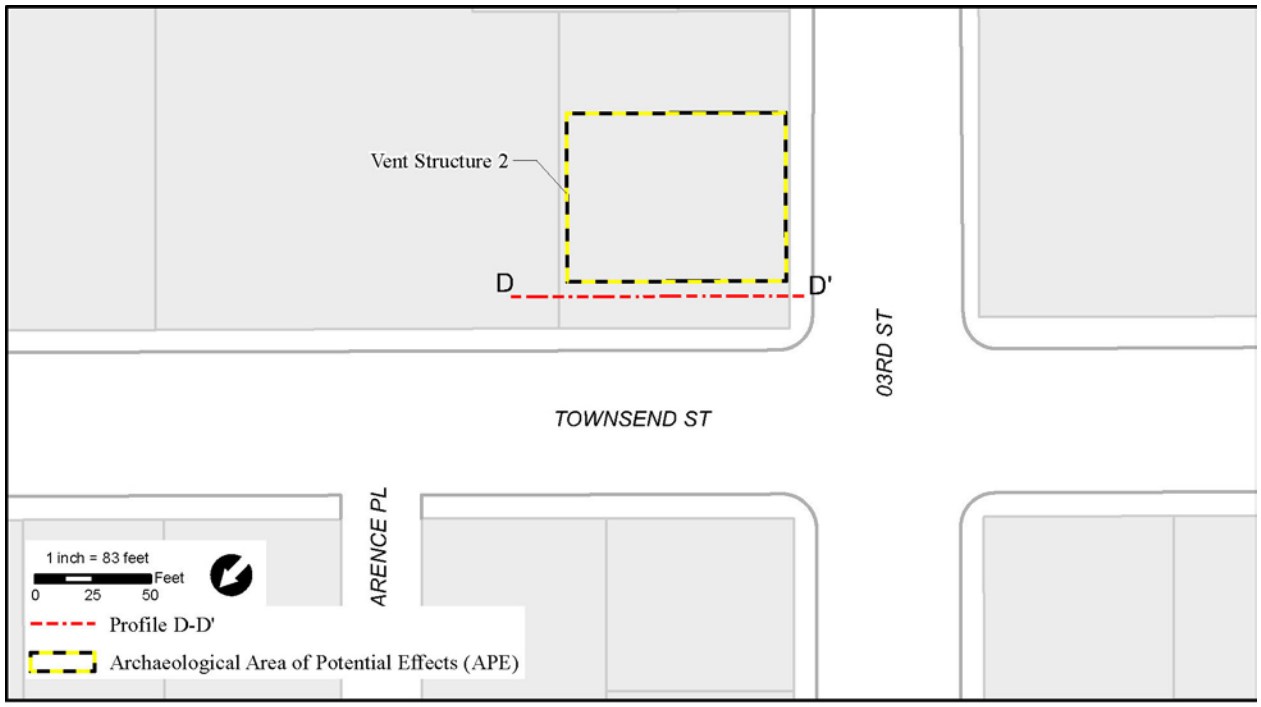
Figure 3.6-2b Vertical Archaeological APE

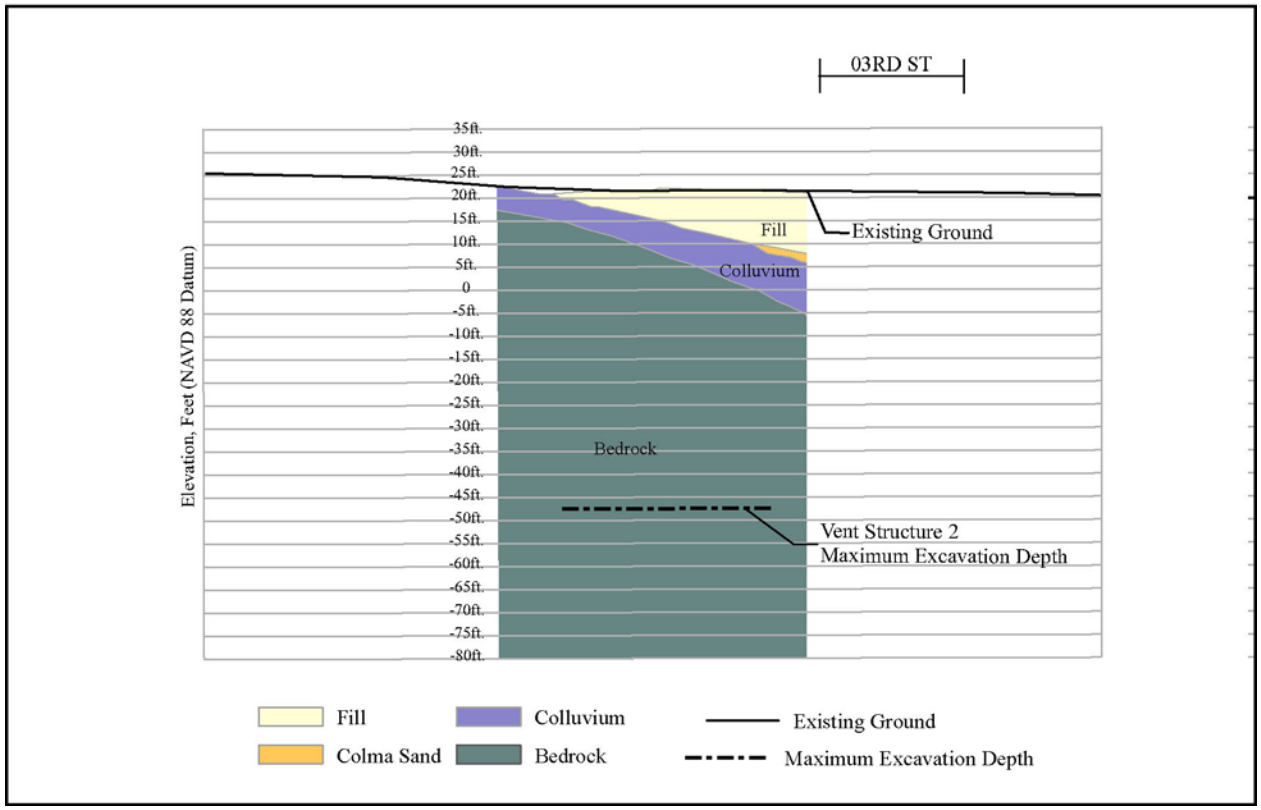




Sources: Created by William Self Associates 2014

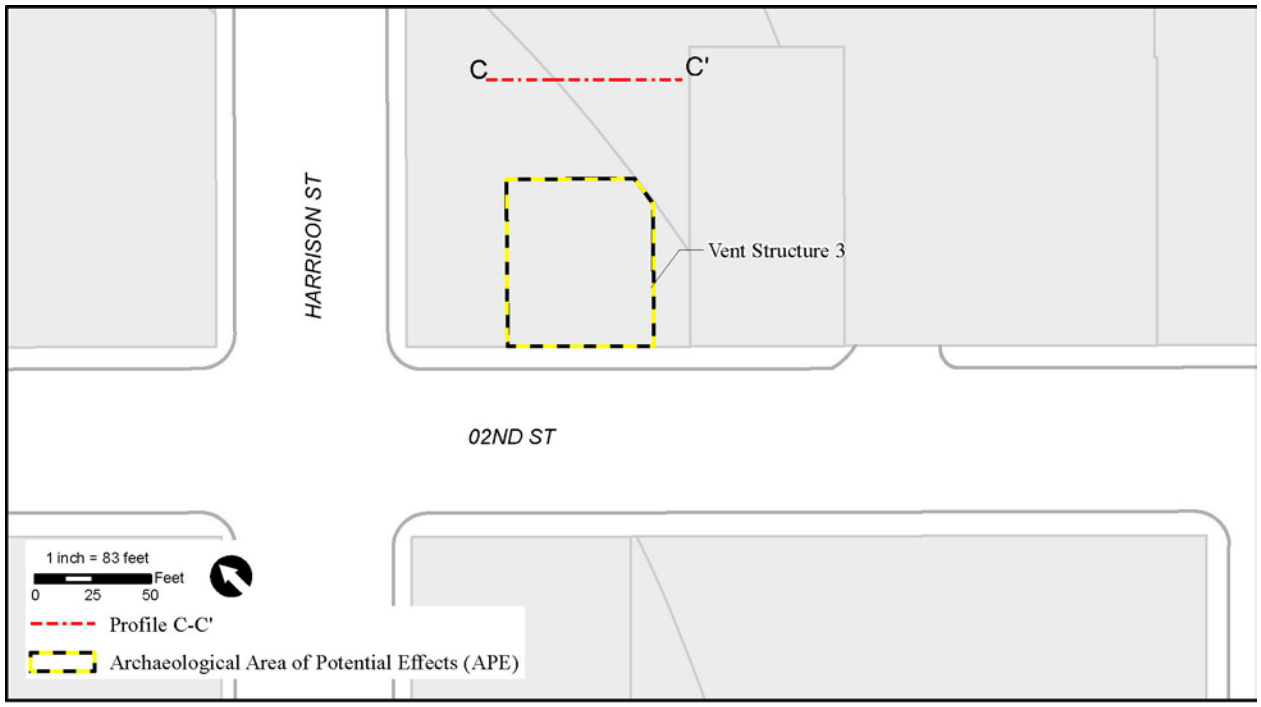
Figure 3.6-2c Vertical Archaeological APE

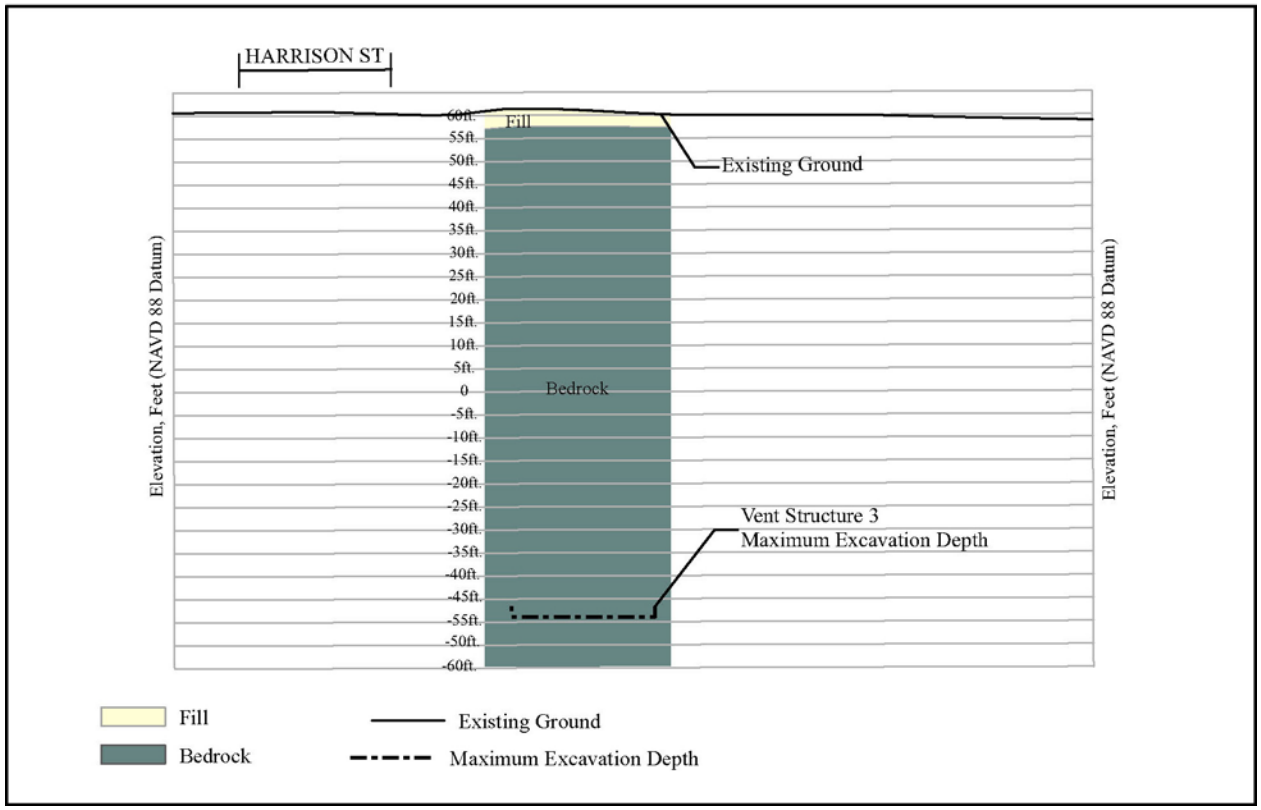




Sources: Created by William Self Associates 2014

Figure 3.6-2d Vertical Archaeological APE





Sources: Created by William Self Associates 2014

Figure 3.6-2e Vertical Archaeological APE

CA-SFR-151/H

The dual-component historic and prehistoric archaeological site CA-SFR-151/H (P-38-004326) encompasses the city block between First, Second, Howard, and Folsom Streets. Limited archaeological testing of this site yielded late 19th-century ground surfaces, building foundations, and hollow-filled features. A prehistoric shell midden buried in dune sand 11.5 feet below the ground surface in the vicinity of 41 Tehama Street was discovered during testing prescribed by the ARDTP for the Transit Center District Plan Area (Byrd et al. 2010). As mapped, the shell midden appears to lie well outside of the Archaeological APE for the proposed project. Nonetheless, this discovery attests to the high sensitivity for prehistoric resources in the immediate vicinity of, and possibly within, the footprint of the widened throat structure. CA-SFR-151/H has not been listed, or formally determined eligible for listing, in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR).

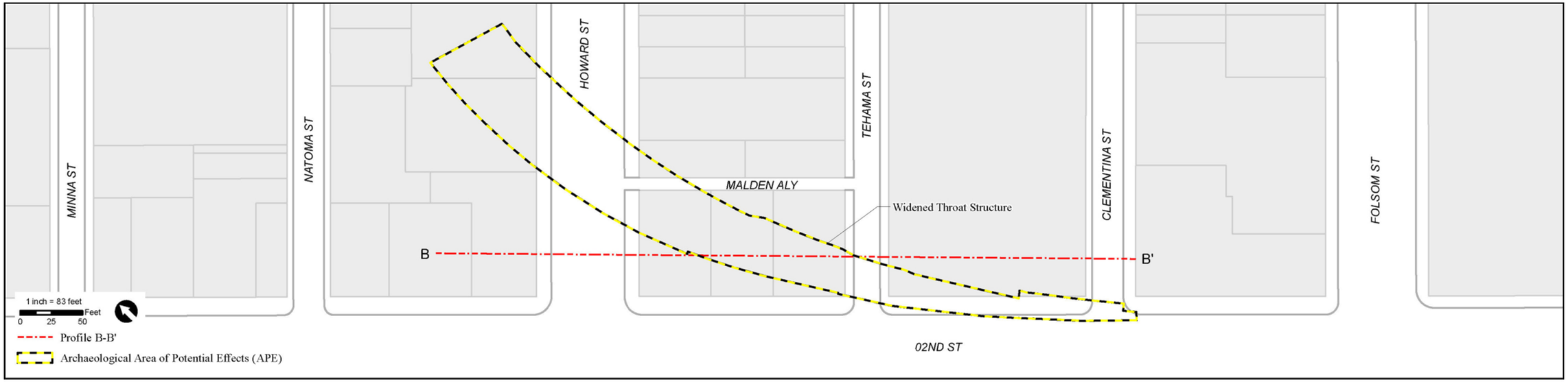
CA-SFR-152H

The vent structure footprint at Second and Harrison Streets sits within the northwest corner of archaeological site CA-SFR-152H, which encompasses the entire city block between Second, Harrison, and Bryant Streets, and the extension of Essex Street. Like CA-SFR-151/H, this site yielded late 19th-century ground surfaces, building foundations, and hollow-filled features during archaeological investigations for the SFOBB West Approach Replacement Project in the southeastern corner of the block, well outside of the footprint for the vent structure at Second and Harrison Streets (Anthropological Studies Center 2007). CA-SFR-152H has not been listed, or formally determined eligible for listing, in the NRHP or CRHR.

Prehistoric Native American District

Among the more important recent developments arising from the archaeological investigations and preservation efforts within the City, and in the project area in particular, is the newly recognized historic district with the theme *Prehistoric Native American Shellmiddens on Mission Bay* (Prehistoric District). The Prehistoric District was determined eligible for listing in the NRHP and CRHR by the City in concurrence with the SHPO in 2010. The period of significance for the Prehistoric District is 2100 to 150 Before Present. The Prehistoric District lies in the immediate vicinity of the Archaeological APE, although none of the prehistoric Native American archaeological sites that are listed as contributing elements (CA-SFR-2, -113, -114, -147, -155, and -154/H) fall within the Archaeological APE. The geographical boundaries of the Prehistoric District have not yet been formally defined, but given the geographical range of these contributing elements and the rarity and value placed on this type of resource by the City, it is reasonable to expect that prehistoric archaeological remains discovered during project construction would be evaluated not only for their potential eligibility for listing in the NRHP and CRHR as individual properties, but also as contributing elements to the Prehistoric District.

Within the footprint of the Phase 1 Transbay Program train box, in between but not within either the APE for the widened throat structure or the extended train box, the TJPA recently discovered a Native American interment at a depth of approximately 55 feet below ground surface buried within the Lower Bay Mud. This stratum was deposited under estuarine conditions at the edge of the Bay waters. Scientific analyses and technical reports have not yet been completed, but a preliminary estimate of the age of the burial, based on the geological and stratigraphic context in which it was found is between 6,000 and 8,000 years old, and this was confirmed with the results of a radiocarbon date on bone collagen from the human skeletal material of cal BP (Before Present) 7660 to 7570 (2 sigma calibrated result, Beta 378760). The adult male was carefully placed on his side in a tightly tucked position, partially wrapped with a textile mat of woven plant fibers, and accompanied by his wooden atlatl (spear thrower). The discovery is unique in the history of San Francisco, and although it does not fall within the APE, it lies less than two blocks away from and in between the widened throat structure and the extended train box.



Sources: Created by William Self Associates 2014

Figure 3.6-2f Vertical Archaeological APE

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Historic Architectural Resources

Area of Potential Effects

The proposed project Architectural APE includes any historic-period building, structure, or object that may be directly or indirectly affected by implementation of the project. The Architectural APE includes the extent of proposed construction for most project components (i.e., the project "footprint") and the area surrounding each component up to generally one parcel. An exception to the one-parcel area around a proposed project component was made for the rock dowels, the additional trackwork south of the Caltrain railyard, the taxi staging area, the AC Transit bus storage facility parking, and the underground pedestrian connector. For each of these proposed project components, minimal construction activity, no new infrastructure outside of existing transportation right-of-ways, or new above-ground facilities would occur. Therefore, these components would have no potential to affect the built environment.

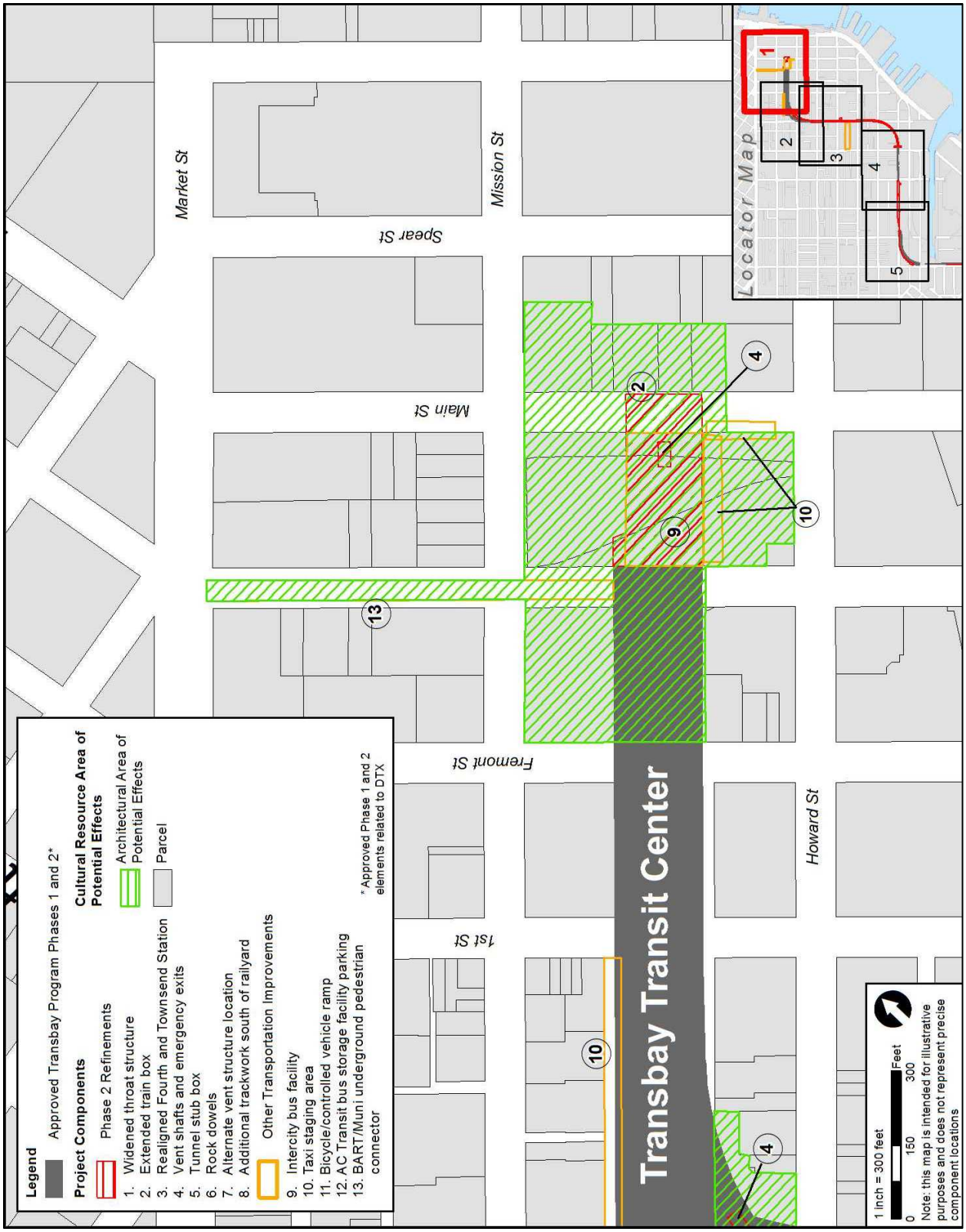
The Architectural APE conforms to the methods used to establish the Architectural APE for the Transbay Program as delineated by the FTA in 2001 in consultation with the SHPO. The Architectural APE is shown in Figure 3.6-3a through 3.6-3e.

Documented Architectural Resources

The list of known historic properties located within the Architectural APE, along with eligibility status information, is shown in Table 3.6-1. All of the identified resources are historic districts; there are no individually listed or eligible properties within the proposed project Architectural APE. The historic districts that fall within the Architectural APE are delineated in Figure 3.6-4. Descriptions of each of the historic districts are provided below.

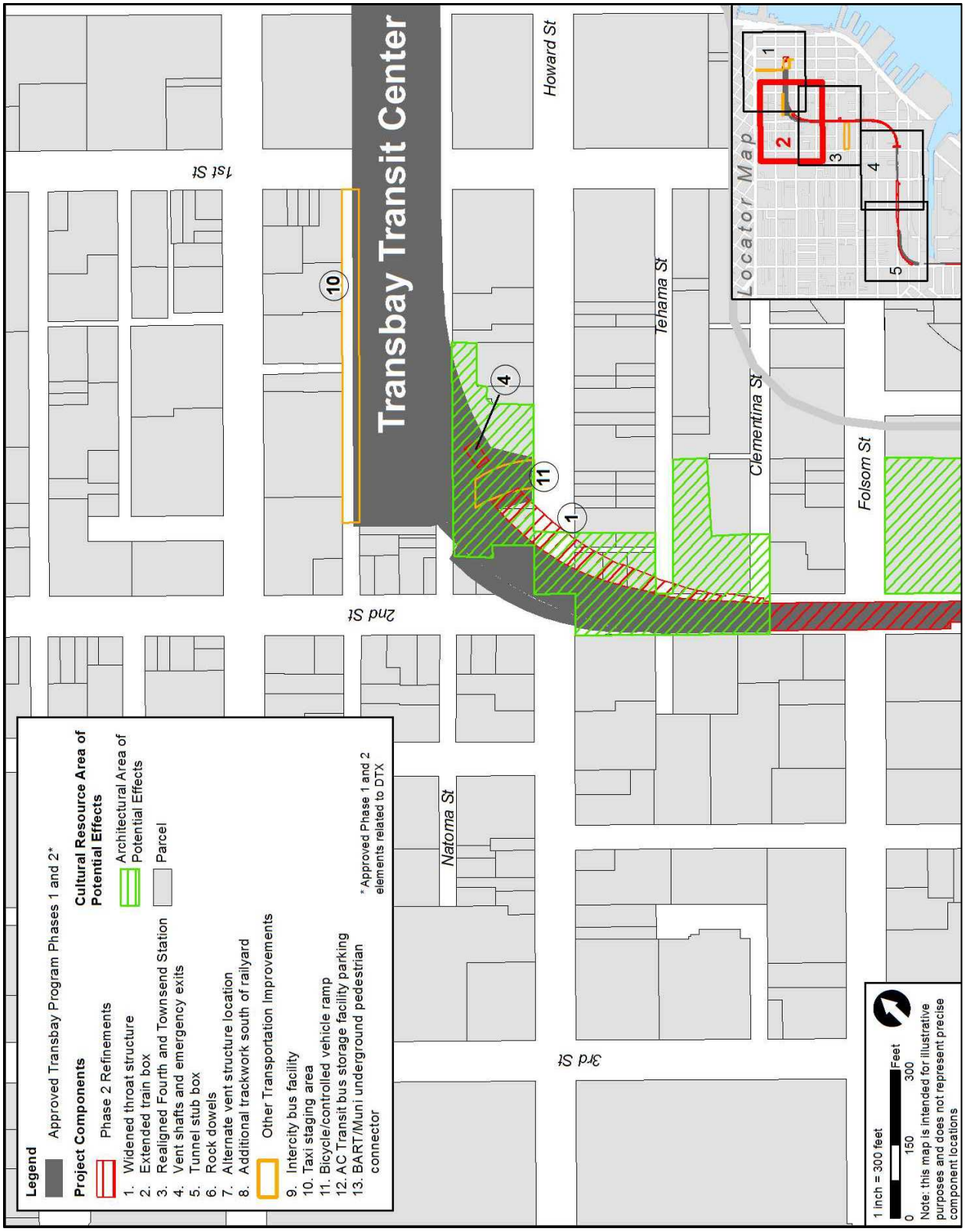
Table 3.6-1
Historic Districts within the Proposed Project Architectural APE

Historic District Name	Eligibility Status	CEQA Historical Resource? (yes/no)	NHPA/106 Historic Property? (yes/no)
Second and Howard Streets Historic District	NRHP Historic District	Yes	Yes
Rincon Point/South Beach Historic Warehouse-Industrial District	NRHP-Eligible Historic District; CRHR-Eligible Historic District	Yes	Yes
South End Historic District	San Francisco Article 10 Historic District; NRHP-Eligible Historic District	Yes	Yes
Bluxome and Townsend Warehouse District	NRHP-Eligible Historic District	Yes	Yes
San Francisco Fire Department Auxiliary Water Supply System	NRHP Historic District; CRHR Historic District	Yes	Yes
New Montgomery-Mission-Second Street Conservation District	San Francisco Article 11 Conservation District; CRHR-Eligible Historic District	Yes	No
Source: Compiled by AECOM in 2014			



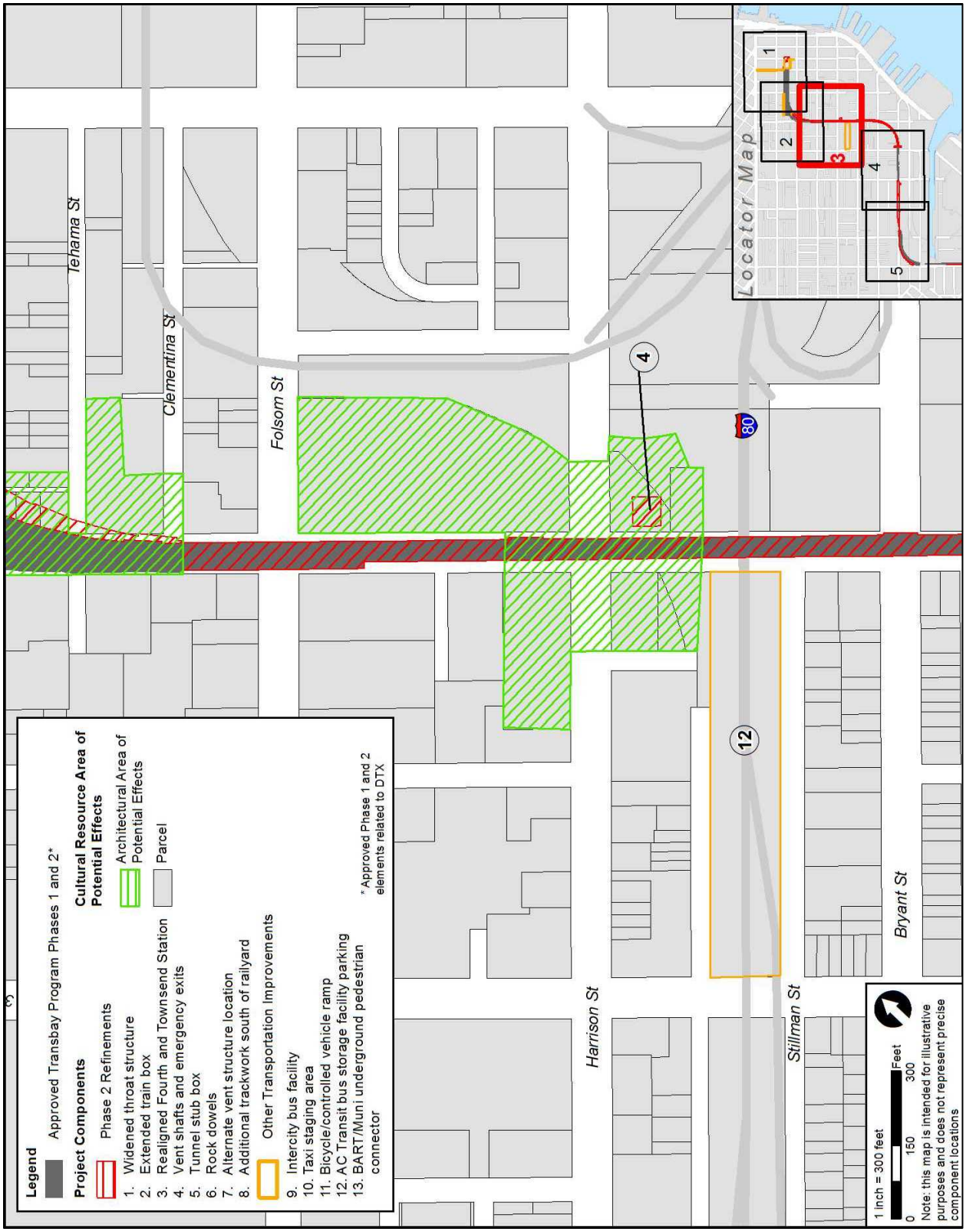
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3a Architectural APE



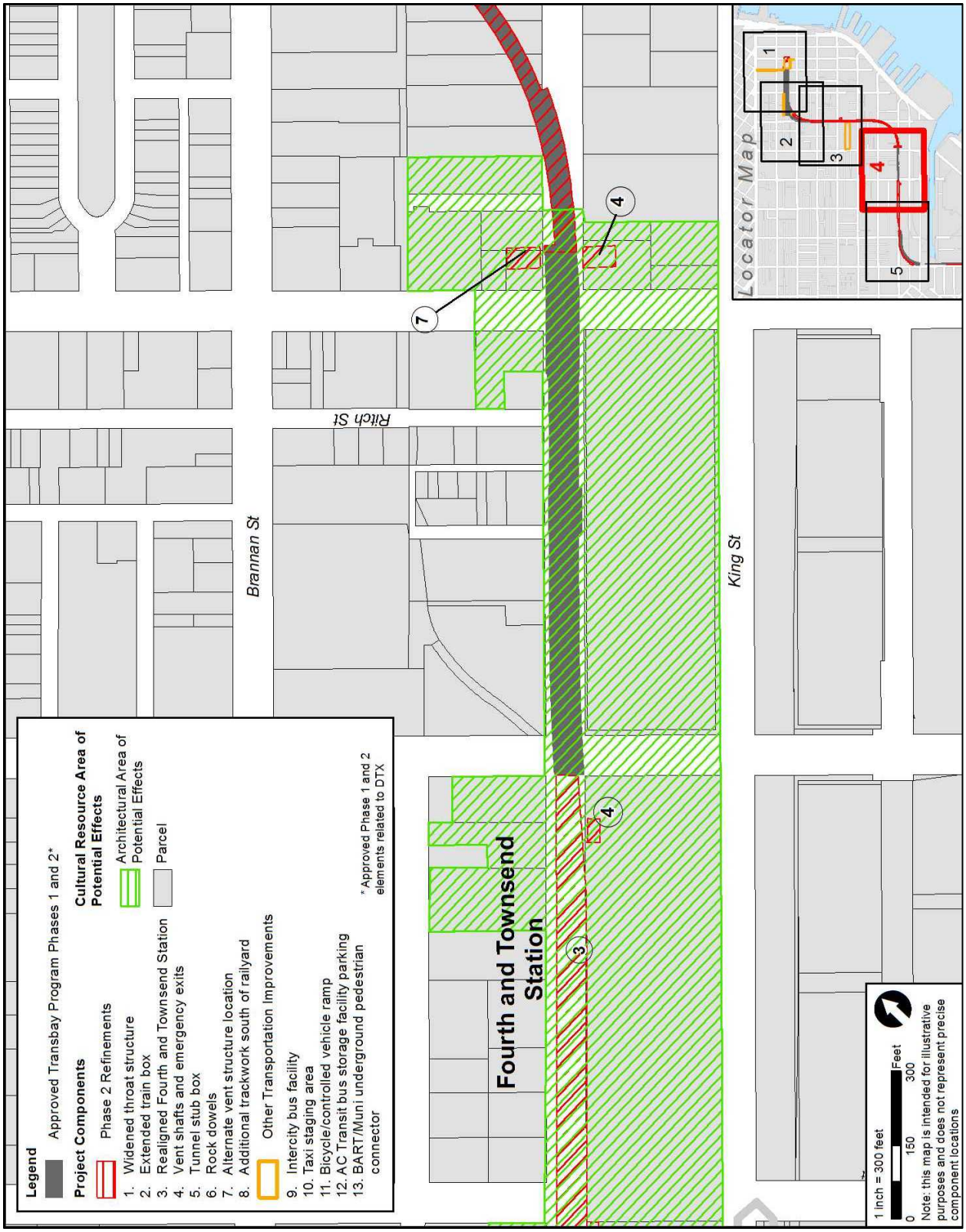
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3b Architectural APE



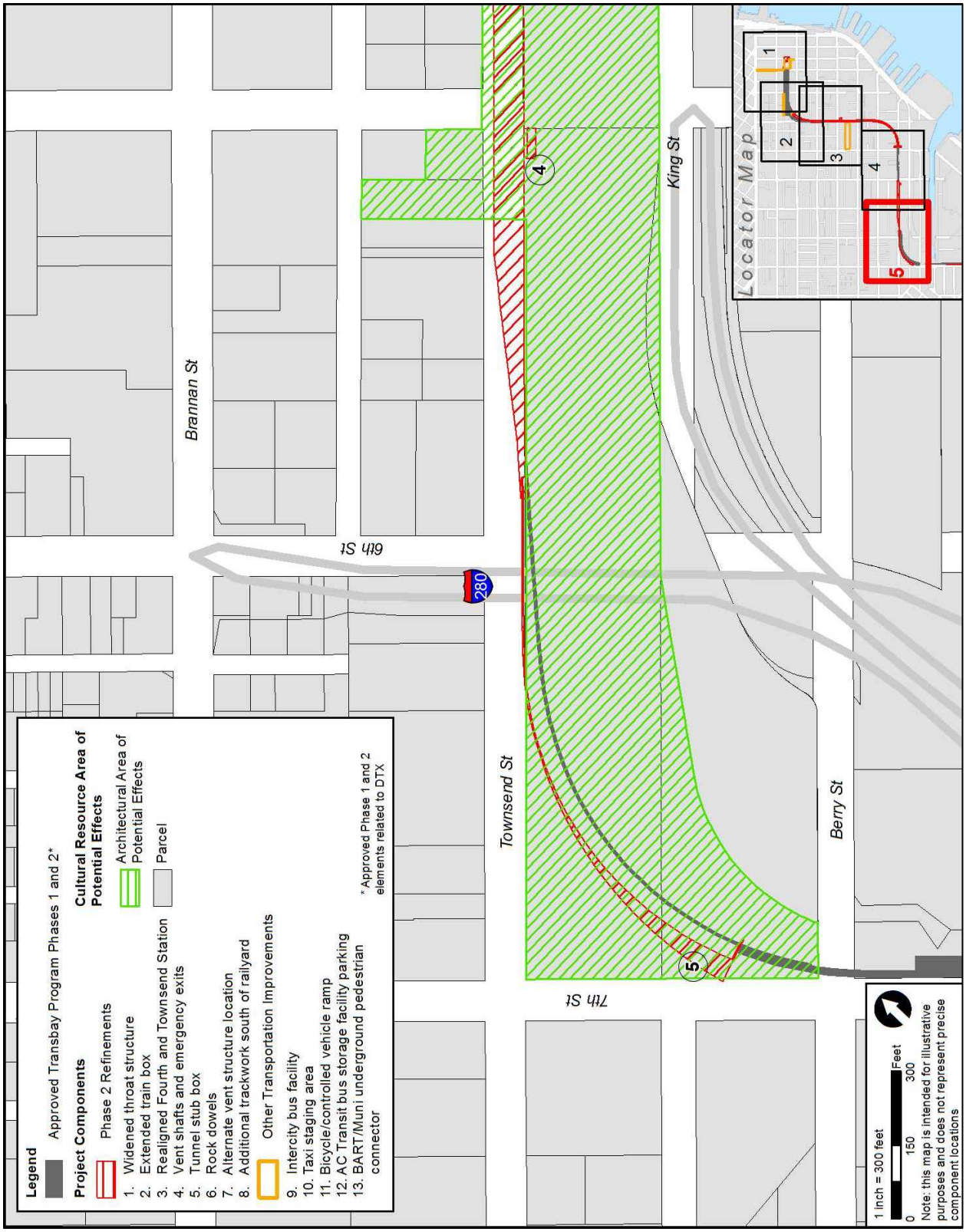
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3c Architectural APE



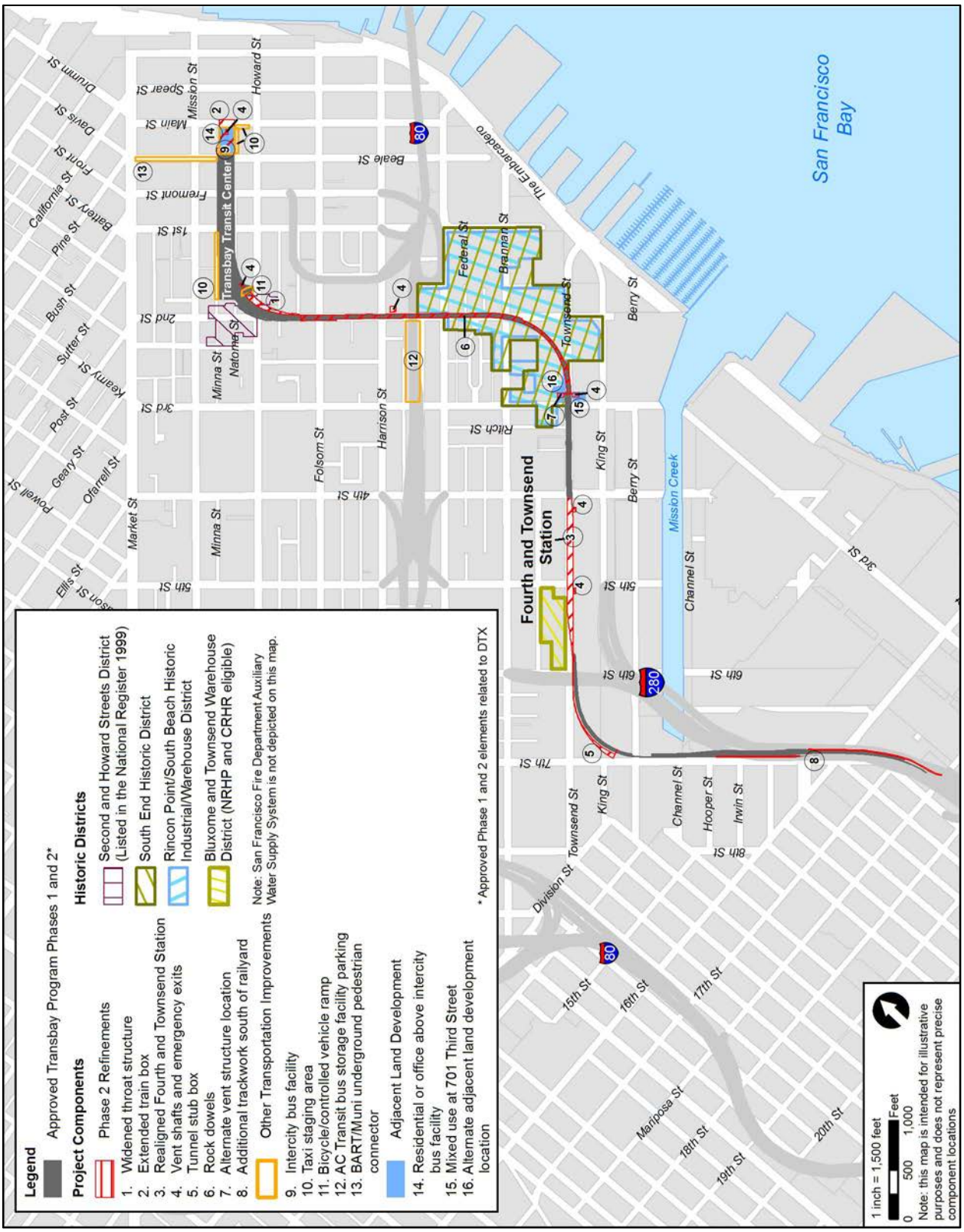
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3d Architectural APE



Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3e Architectural APE



Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-4 Historic Districts within the Architectural APE

Second and Howard Streets NRHP Historic District

The Second and Howard Streets Historic District was listed in the NRHP in 1999 (Bloomfield 1998). The district consists of 19 contributing properties on Second, Howard, Natoma, and New Montgomery Streets, and three non-contributors on Second Street. The district was listed in the NRHP at the local level of significance for its architectural significance (NRHP Criterion C) within the context of San Francisco's rebuilding after the 1906 earthquake and fire. All of the contributing properties were constructed between 1906 and 1912, the district's period of significance. The contributing properties are commercial-style buildings with Renaissance-Baroque ornamentation (Bloomfield 1998).

The Second and Howard Streets Historic District is partially surrounded by an Article 11 Conservation District known as the New Montgomery-Mission-Second Street Conservation District (described below).

Rincon Point/South Beach Historic Warehouse-Industrial District

The Rincon Point/South Beach Historic Warehouse-Industrial District was identified and in 1983 by the California Department of Transportation (Caltrans) for the Interstate 280 Transfer Concept Project (Caltrans 1983). This area of San Francisco was developed beginning in the 1850s and 1860s after landfill and warehouse construction changed the physical appearance of the waterfront. The district was identified by Caltrans historians as appearing eligible for the NRHP. That research found that the district appeared eligible under all four NRHP criteria. Approximately 60 buildings within the district were identified as contributing to the district's significance. The Rincon Point/South Beach Historic Warehouse Industrial District was designated as locally significant and determined eligible for listing in the CRHR.

South End Historic District

In 1990, the City established an Article 10 district called the South End Historic District (City of San Francisco 1990). In October 2008, the district was certified by the Secretary of the Interior for the purposes of the Tax Reform Act of 1986, as eligible for the NRHP (Lapsley 2008). When it was determined eligible the district included 55 contributing buildings, primarily light industrial buildings and warehouses, and 23 non-contributing buildings. The boundaries were originally defined by Bryant, First, King, and Third Streets. In 2010, the boundaries were expanded on the eastern border to incorporate an additional 12 contributing properties. The boundaries of the South End Historic District are nearly identical to the Rincon Point/South Beach Historic Warehouse-Industrial District.

Bluxome and Townsend Warehouse District

A portion of the Bluxome and Townsend Warehouse District is located within the APE. This district appears eligible for the NRHP under Criterion A and C and has nine contributing buildings within its boundaries. The period of significance for the district is 1912 to 1936. The district is industrial in character and ornamentation reflects the Classical Revival, Spanish Revival, and Art Deco architectural styles. The district appears significant for its association with an important trend in development patterns in San Francisco, and as a representation of a group of properties that embody the distinctive characteristics of a type, period, or method of construction (Page & Turnbull 2009). The district appears to remain eligible for the NRHP.

San Francisco Fire Department Auxiliary Water Supply System

The Auxiliary Water Supply System (AWSS), also referred to as the San Francisco Fire Department High Pressure System, is a system of mains and 1889 high-pressure fire hydrants that functions independent of the City's domestic water supply and used solely for firefighting. The system is supplied with fresh water by gravity from a reservoir and two tanks located at high elevation in the City. The AWSS was determined eligible for listing in the NRHP and CRHR in 2009 (Mates 2009). The AWSS was determined eligible under Criteria A/1 for its association with the 1906 earthquake and the period of rebuilding and

reconstruction after the earthquake and fires. The AWSS is significant under Criteria C/3 as an innovative design of a water-supply system during post-earthquake reconstruction. The period of significance for the district under Criteria A/1 is 1908 through 1913. The period of significance under Criteria C/3 is 1908 through 1964. The district boundaries are the footprint of the pipes, tunnels, buildings, and structures. The discontiguous historic district includes one reservoir, two storage tanks, two pump stations, 172 cisterns, approximately 135 miles of pipe, 52 suction connections located along the northeastern waterfront, two fire boats, 1,600 hydrants, and 3,828 valves. The San Francisco AWSS was transferred to the San Francisco Public Utilities Commission, effective 2010.

New Montgomery-Mission-Second Street Article 11 Conservation District

The New Montgomery-Mission-Second Street Conservation District meets the eligibility requirements for listing in the CRHR and as a San Francisco Article 11 Conservation District. Conservation Districts are identified by the City as being areas of special architectural and aesthetic importance. The New Montgomery-Mission-Second Street Conservation District is significant as a collection of buildings representing the post-1906 reconstruction of downtown San Francisco. Rebuilt between 1906 and 1933, the district features a collection of masonry commercial loft buildings—two to eight stories in height—with high architectural integrity. All contributors are of a similar scale, massing, setback, materials, fenestration pattern, style, and architectural detailing. Originally adopted by the City in 1985 as the New Montgomery-Second Street Conservation District, it was established because the area "possesses concentrations of buildings that together create a subarea of architectural and environmental quality and importance which contributes to the beauty and attractiveness of the City."[1]

The district was revised and renamed the New Montgomery-Mission-Second Street Conservation District in 2012 (City of San Francisco 2012b). At that time, the district was expanded to include 26 additional properties, primarily along Mission, Natoma, and Howard Streets. The amended district contains approximately 77 individual parcels encompassing 64 contributing resources (Categories I–IV) and 13 non-contributing resources (Category V). The period of significance for the district was amended from 1906–1929 to 1906–1933.

Paleontological Resources

The San Francisco Bay area during the Miocene (approximately 10 to 24 million years Before Present) would have looked much like the modern African savannah, and the San Francisco Bay as it is today would not have existed. Active volcanoes were present in the rising Berkeley Hills, and flora and fauna from the Miocene included elm and poplar trees, horses, antelope, sabre-toothed cats, and mammoths.

Previous research in the vicinity has suggested that fill and dune sand are not subsurface soil components that typically contain paleontological resources (City of San Francisco 2012b). Further, it has been suggested that the marsh deposits are of such a young age as to not likely contain such resources. However, in September 2012, construction at the Transit Center was temporarily halted when a fossilized tooth and jaw of a Columbian mammoth (*Mammuthus columbi*) was unearthed at a depth of 110 feet below ground surface (TJPA 2012). To date, no additional fossilized remains have been discovered, but there is a possibility of additional fossils being present.

The Society of Vertebrate Paleontology guidelines (SVP 1995) establish three categories of sensitivity for paleontological resources: High probability areas are those where fossils have been previously found, low sensitivity areas are not sedimentary in origin and have not been known to produce fossils, and

[1] Ordinance 414-85, approved September 17, 1985.

undetermined sensitivity areas are those that have not been the subject of previous paleontological surveys and have not yet yielded fossil finds. All vertebrate fossils are considered to have potentially significant scientific value.

The University of California Museum of Paleontology database (UCMP 2014) indicates that 13 vertebrate fossils have been recovered throughout San Francisco County, but only two have been identified near the proposed project area: a Pleistocene *Equus* (sp. unspecified) and the *Mammuthus columbi* fossils, the latter having been unearthed during construction at the Transit Center. Therefore, in accordance with the guidelines defined by the Society of Vertebrate Paleontology (SVP 1995), this proposed project possesses a high sensitivity for uncovering additional similar paleontological resources during construction-related earthmoving activities.

Regulatory Framework

The following discussion summarizes the relevant laws, regulations, and policies concerning archaeological, built environment, and paleontological resources, highlighting new guidance issued since the 2004 FEIS/EIR.

Federal

Historic Sites Act (1935)

The Historic Sites Act, regulated under 16 USC 461 et seq., declares a national policy to preserve historic sites, buildings, antiquities, and objects of national significance, including those located on refuges. The Historic Sites Act provides procedures for designation, acquisition, administration, and protection of such sites.

National Historic Preservation Act, as Amended (1966)

The NHPA declares federal policy to protect historic sites and values in cooperation with other nations, states, and local governments. The NHPA establishes a program of grants to assist states with historic preservation activities. Subsequent amendments designated the SHPO as the individual responsible for administering state-level programs. The NHPA also created the President's Advisory Council on Historic Preservation (ACHP). Federal agencies are required to consider the effects of their undertakings on historic resources, and to give the ACHP a reasonable opportunity to comment on those undertakings. A lead federal agency is responsible for project compliance with Section 106 of the NHPA and its implementing regulations, set forth by the ACHP at 36 CFR 800.

Archaeological and Historic Preservation Act (1974)

Under 16 USC 469–469c, the Archaeological and Historic Preservation Act requires federal agencies to provide notice to the Secretary of the Interior of any dam constructions or alterations of terrain, and, if archaeological resources are found, for recovery or salvage of them. The law applies to any agency whenever it receives information that a direct or federally assisted activity could cause irreparable harm to prehistoric, historic, or archaeological data. Up to 1 percent of project funds could be used to pay for salvage work. The NHPA also authorized additional funding to be availed for this purpose.

American Indian Religious Freedom Act (1978)

The American Indian Religious Freedom Act, 42 USC 1996, et seq., regulated under 43 CFR 7, was established to protect religious practices, ethnic heritage sites, and land uses of Native Americans. It directs various federal departments, agencies, and other instrumentalities responsible for administering relevant laws to evaluate their policies and procedures in consultation with Native American traditional religious leaders and to determine changes necessary to protect and preserve Native American cultural and religious practices.

Archaeological Resources Protection Act (1979)

The Archaeological Resources Protection Act supplements the provisions of the Antiquities Act of 1906, and declares it illegal to excavate or remove from federal or Native American lands any archaeological resources without a permit from the land manager (or federal agency with jurisdiction over those lands).

State

CEQA and CEQA Guidelines

In California, cultural resources include archaeological and historical objects, sites and districts, historic buildings and structures, cultural landscapes, and sites and resources of concern to local Native American and other ethnic groups. Under CEQA and its implementing guidelines, these cultural resources are called historical resources, whether they are of historic or prehistoric age. CEQA Public Resources Code Section 21084.1 defines historical resources as those listed, or eligible for listing, in the California Register of Historical Resources, or those listed in the historical register of a local jurisdiction (county or city). Section 21084.1 also defines the level of change that would cause a significant effect on a historic resource. The definition in Section 21084.1 cross references PRC Sections 5020.1 and 5024.1. CEQA Guidelines Sections 15064.5 and 15126.4 provide more detailed definitions of what constitutes a significant impact on historical resources, unique archeological resources, and human remains (discussed further below). CEQA Guidelines Section 15126.4(b) prescribes adequate mitigation for historical resources. See also PRC Section 5097 et seq.

The definition of a "unique archaeological resource" for the purposes of CEQA is found in PRC Section 21083.2. The significance of impacts to unique archaeological resources and mitigation requirements are also governed by Section 21083.2. In addition, CEQA Guidelines Sections 15064.5 and 15126.4(b) provide more detailed requirements. Section 15064.5 of the CEQA Guidelines also sets forth the steps to be taken in the event that human remains are found and procedures to be followed when Native American remains may exist, there is a probable likelihood of discovery, or are discovered. These procedures are detailed under PRC Section 5097.98. Although CEQA does not define "unique paleontological resource or site," PRC Sections 21083.2(g) and (h) define "unique archaeological resources" and "nonunique archaeological resource," and the criteria identified there are considered applicable for paleontological resources.

California Native American Graves Protection and Repatriation Act (2001)

In the California Health and Safety Code, Division 7, Part 2, Chapter 5 (Sections 8010–8030), broad provisions are made for the protection of Native American cultural resources. The Native American Graves Protection and Repatriation Act sets the state policy to ensure that all California Native American human remains and cultural items are treated with due respect and dignity.

California Public Resources Code, Section 5020

This California code created the California Historic Landmarks Committee in 1939, and authorizes the Department of Parks and Recreation to designate Registered Historical Landmarks and Registered Points of Historical Interest.

California Public Resources Code, Section 5097.9

Procedures are detailed under PRC Section 5097.9 for actions taken whenever Native American remains are discovered. No public agency and no private party using or occupying public property or operating on public property under a public license, permit, grant, lease, or contract made on or after July 1, 1977, can, in any manner whatsoever, interfere with the free expression or exercise of Native American religion as provided in the United States Constitution and the California Constitution, nor shall any such agency or

party cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine on public property, except on a clear and convincing showing that the public interest and necessity so require.

California Public Resources Code, Section 7050.5

Every person who knowingly mutilates, disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor, except as provided in PRC Section 5097.99. In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains will occur until the coroner of the county in which the human remains are discovered has determined that the remains are archaeological. If the coroner determines that the remains are not subject to his or her authority, and if the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact the NAHC by telephone within 24 hours.

California Public Resources Code, Section 7051

Every person who removes any part of any human remains from any place where it has been interred, or from any place where it is deposited while awaiting interment or cremation, with intent to sell it or to dissect it, without authority of law or written permission of the person or persons having the right to control the remains under PRC Section 7100, or with malice or wantonness, has committed a public offense that is punishable by imprisonment in a state prison.

California Code of Regulations, Title 14, Section 4307 and Section 4308

Under this state preservation law, no person can remove, injure, deface, or destroy any object of paleontological, archaeological, or historical interest or value.

Local

San Francisco Planning Code, Articles 10 and 11

The Office of Historic Preservation has included the City and County of San Francisco on its list of Certified Local Governments, which means that San Francisco has an approved historic preservation ordinance, Historic Preservation Commission, and other formal processes related to historic preservation and cultural resources management. Article 10 of the Planning Code describes procedures regarding the preservation of sites and areas of special character or special historical, architectural, or aesthetic interest or value that are designated as City Landmarks and included within locally designated historic districts. Article 11 of the Planning Code designates six downtown conservation districts, one of which, the New Montgomery-Mission-Second Street Conservation District, is in the study area for the proposed project.

3.6.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

NHPA Section 106 Criteria for Assessing Effects

NHPA Section 106 criteria for assessing adverse effects provide the framework for assessing how projects affect historic properties located within an APE. According to 36 CFR 800.5, undertakings would have an adverse effect on historic properties if the project impairs the characteristics that qualify a property for inclusion in the NRHP. Official determinations of effect are based on SHPO's review of the Findings of Effect, which is attached to this SEIS/EIR as Appendix G.2. Until SHPO has concurred with the effects determinations, the effect conclusions in this Draft SEIS/EIR are preliminary. As a result, it

should be understood that the effects described in this section are made with respect to NEPA and not Section 106, although the Section 106 criteria have been applied in the assessment.

When considering a historic district, the integrity of the whole is considered paramount to the individual integrity of any one component (unless there are individually eligible buildings, structures, or objects present). Thus, in some cases, actions that would result in an impairment of the integrity of an individually eligible building or structure may not be considered actions that would impair the integrity of a historic district, depending on the reasons that the district is eligible in the first place.

Although not comprehensive, the following is a list of actions that typically result in a finding of adverse effect on a historic property:

- Physical destruction of or damage to all or part of the property.
- Alteration of the property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access that is not consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 CFR 68) and applicable guidelines.
- Removal of the property from its historic location.
- Changing the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of the property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to a Native American tribe or Native Hawaiian organization.
- Transfer, lease, or sale of the property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

CEQA Criteria for Assessing Impacts

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines. The proposed project would have a significant impact on cultural resources if it would do any of the following:

- cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;
- cause a substantial adverse change in the significance of a unique archaeological resource[2] pursuant to Section 15064.5;

[2] See Public Resources Code Section 21083.2(a) (an EIR "shall not address the issue of non-unique archaeological resources"); see also CEQA Guidelines Section 15064.5(c)(4) (same).

- disturb any human remains, including those interred outside of formal cemeteries;
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- disturb any human remains, including those interred outside of formal cemeteries.

Issues Not Addressed Further in this SEIS/EIR

Unique Geologic or Physical Features. No unique geologic or physical features were identified in the Transbay Program area; therefore, the 2004 FEIS/EIR did not address unique geologic or physical features. Because the proposed project area is almost entirely paved and developed, no unique geologic features such as prominent hills, exceptional rock outcroppings, or similar geophysical features occur. Therefore, the proposed project would not alter such features.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, cultural resources effects will be the same as those presented in Section 5.14 Historic and Cultural Resources (pages 5-85 to 5-111) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects, plus Mitigation Measures CH 1 through CH 20, which were previously adopted and incorporated into the Transbay Program, is provided later in this section. The full text of the mitigation measures is presented in Appendix C of this SEIS/EIR. Paleontological resources were not specifically addressed in the previously certified 2004 FEIS/EIR.

The adopted mitigation measures, as revised in November 2007, include two measures that apply to both archaeological and historical resources. Mitigation Measure CH 1 requires compliance with the signed MOA, which was executed by the FTA, SHPO, and TJPA to resolve Section 106 adverse effects (FTA 2004b). Mitigation Measure CH 2 requires that all activities involving historic and cultural resources be performed or supervised by professionals meeting the Secretary of the Interior's professional qualifications standards, and that the work be done in accordance with cited federal and state standards for historic preservation and archaeological curation.

Archaeological Resources. No known archaeological resources are either listed in or eligible for listing in the CRHR or NRHP within the No Action Alternative Archaeological APE; however, the potential for post-review discovery of such resources was identified in the 2004 FEIS/EIR and in subsequent addenda. The substantial adverse changes in the significance of previously unrecorded and as-yet-unknown archaeological resources pursuant to Section 15064.5 of the CEQA guidelines have been and will continue to be reduced to less-than-significant through implementation of previously adopted Mitigation Measures CH 15 through CH 20, identified in the 2004 FEIS/EIR (see Appendix C) and memorialized in the MOA (FTA 2004b). To reduce impacts to archaeological resources, TJPA has previously approved and incorporated into the Transbay Program the measures summarized below and provided in full in Appendix C:

- **CH 1** – comply with the provisions of the signed MOA.
- **CH 2** – ensure that work involving cultural resources will be carried out by or under the direction of individuals meeting or exceeding the Secretary of the Interior's professional qualifications standards.

- **CH 3** – integrate interpretive exhibit space into the new terminal.
- **CH 4** – consult with the State Department of Transportation (Caltrans) regarding historic documentary materials for use in the interpretive display.
- **CH 5** – consult with the City of Oakland regarding a similar interpretive display on the East Bay.
- **CH 6** – in consultation with the Caltrans, identify elements that may be suitable for salvage and interpretive use by museums.
- **CH 7** – consult with the Oakland Museum of California regarding the Caltrans' exhibit and the production of an interpretive video.
- **CH 8** – contribute $50,000 to the Oakland Museum toward the cost of the preparation of the exhibit and associated materials.
- **CH 9** – request that SHPO determine that project components have been adequately recorded and that no additional documentation is necessary.
- **CH 10** – reevaluate the Bay Bridge within 180 days after FTA determines that the project has been completed.
- **CH 15** – consult with FTA, SHPO, the Joint Powers Board, and the City within 45 days of MOA execution to initiate the process of determining how archaeological properties that may be affected by the project will be identified, how NRHP eligibility will be addressed, and how effects on archaeological properties will be taken into account.
- **CH 16** – prepare a treatment plan if the consulting parties agree that one is necessary.
- **CH 17** – prepare a draft technical report documenting the results of treatment plan implementation, if one was required, within two years of completion and in consultation with FTA.
- **CH 18** – if a treatment plan will not be prepared, address any archaeological properties discovered during implementation.
- **CH 19** – ensure that all actions and documentation are consistent with Section 304 of the NRHP and Section 6254.10 of the California Government Code.
- **CH 20** – treat Native American burials and related items discovered during project implementation in accordance with the requirements of Section 7050.5(b) of the California Health and Safety Code.

Architectural Resources. Impacts to architectural resources associated with the No Action Alternative as evaluated in the 2004 FEIS/EIR and subsequent addenda are summarized below. The MOA that was signed by FTA, SHPO, TJPA, City and County of San Francisco, Peninsula Corridor Joint Powers Board, and California Department of Transportation in June 2004 contains stipulations and mitigations to address adverse effects to the historic properties.

Transbay Terminal. The Transbay Terminal project component already has resulted in the demolition and removal of the Transbay Terminal (425 Mission Street) and elements of the San Francisco Oakland Bay

Bridge. The specific resources affected are shown in the first section of Table 3.6-2. The impacts of the approved Transbay Program on the Transbay Terminal and SFOBB historic properties were addressed by previously adopted Mitigation Measures CH 3 through CH 10, identified in the 2004 FEIS/EIR (see Appendix C) and memorialized in the MOA (FTA 2004b).

Downtown Rail Extension. The DTX will result in the demolition of three NHPA historic properties and CEQA historical resources. The specific resources affected are shown in the second section of Table 3.6-2. The demolitions will constitute an adverse effect under Section 106 and a significant impact under CEQA.

The impacts on the three historic properties requiring demolition were addressed by Mitigation Measure CH 12, which specifies recordation in accordance with the type and level determined through further consultation with the SHPO. The measure specifies that copies of the documentation will be provided to the SHPO, libraries in San Francisco and Oakland, and the local preservation organization San Francisco Architectural Heritage.

The impacts of demolition were further addressed by Mitigation Measure CH 14, which calls for the reevaluation of the Second and Howard Streets Historic District to determine whether the NRHP nomination should be amended, or whether the district no longer qualifies for listing and should be removed from the NRHP. This measure recognizes not only the loss of the three contributors, but the resulting isolation of 589 Howard Street from the rest of the historic district.

The DTX also has the potential to cause damage to NHPA historic properties and CEQA historical resources where construction activities such as cut-and-cover and tunneling occur adjoining or below parcels where such properties and resources are located. The specific resources affected are shown in the third section of Table 3.6-2. The potential damage will constitute an adverse effect under Section 106 and a significant impact under CEQA.

The impacts on historic properties due to potential damage caused by construction activities were addressed by Mitigation Measure CH 11, which specifies protective measures to be developed, implemented, monitored, and supplemented where necessary, and Mitigation Measure CH 13, which specifies standards and procedures for repairing such damage caused by the project.

Redevelopment Components. The redevelopment component of the Transbay Program will not result in an adverse effect on historic properties.

Table 3.6-2
Summary of Transbay Program Impacts on Listed or Eligible Properties in the APE

Address/Assessor's Parcel Number(s)	NRHP Status	Contributing Element of	City Status	Const. Date	Type of Impact
Properties Affected by Transbay Terminal					
425 Mission Street (Transbay Terminal)/ 3719-003, 3720-001, 3721-006	1	SF–Oakland Bay Bridge		1936	Demolition
Bay Bridge Approach/34-116F	1	SF–Oakland Bay Bridge		1936	Demolition
Bay Bridge Approach/34-118L	1	SF–Oakland Bay Bridge		1936	Demolition
Bay Bridge Approach/34-118R	1	SF–Oakland Bay Bridge		1936	Demolition
Terminal Loop Ramps/34-119Y		SF–Oakland Bay Bridge		1936	Demolition
Harrison Street Overcrossing/ 34-120Y		SF–Oakland Bay Bridge		1936	Demolition
Properties Affected by the Downtown Rail Extension (Demolition)					
165–173 Second Street/ 3721-025	1D	Second & Howard District & New Montgomery/ Second Street	Article 11 Category V	1906	Demolition
191 Second Street/3721-022	1D			1907	Demolition
580–586 Howard Street/ 3721-092 through 3721-106	1D	Second & Howard District		1906	Demolition
Properties Affected During Construction Activities					
589–591 Howard Street/ 3736-098	1D	Second & Howard District & New Montgomery/Second Street	Article 11 Category V	1906	Cut-and-cover construction nearby
163 Second Street/3721-048	1D			1907	
166–178 Townsend Street/ 3788-012	3D	Rincon Point/South Beach District & South End District		1888–1910	Cut-and-cover construction nearby; need construction easement
640 Second Street/3788-002	2S2			1925	Tunnel under and near property
650 Second Street/ 3788-049 through 3788-073	2S2			1922	
670–680 Second Street/ 3788-043, 3788-044	2S2 (670), 3D (680)			1913	
301–321 Brannan Street/ 3788-037	3D			1909	
130 Townsend Street/3788-008	3D			1895–1910	
136 Townsend Street/3788-009	3D			1902–1913	
144–146 Townsend Street/ 3788-009A	3D			1922	
148–154 Townsend Street/ 3788-010	3D			1922	
162–164 Townsend Street/ 3788-081	3D			1919	

Table 3.6-2
Summary of Transbay Program Impacts on Listed or Eligible Properties in the APE

Address/Assessor's Parcel Number(s)	NRHP Status	Contributing Element of	City Status	Const. Date	Type of Impact

Notes:
LPA = Locally Preferred Alternative; APE = area of potential effects; Const. = Construction; SF = San Francisco
National Register of Historic Places (NRHP) Status Codes are as follows:
1 Listed on the NRHP
2S1 Determined eligible for listing by the Keeper of the Register
2S2 Determined eligible for listing by consensus of the SHPO and a federal agency
1D Listed on NRHP as a contributor to a district or multi-resource property
2D2 Determined eligible as a contributor by consensus determination
3D Appears eligible as a contributor to a fully documented district
Sources: FTA 2004a:Table 5.14-1; TJPA 2007

To reduce impacts to historic resources, TJPA has previously approved and incorporated into the Transbay Program the measures summarized below and provided in full in Appendix C:

- **CH 1** – comply with the provisions of the signed MOA.
- **CH 2** – ensure that work involving cultural resources will be carried out by or under the direction of individuals meeting or exceeding the Secretary of the Interior's professional qualifications standards.
- **CH 6** – in consultation with the Caltrans, identify elements that may be suitable for salvage and interpretive use by museums.
- **CH 9** – request that SHPO determine that project components have been adequately recorded and that no additional documentation is necessary.
- **CH 10** – reevaluate the Bay Bridge within 180 days after FTA determines that the project has been completed.
- **CH 11 –** in consultation with property owners, develop and implement measures to protect contributing elements of historic properties.
- **CH 12** – determine the level and type of recordation necessary prior to adversely affecting historic properties.
- **CH 13** – repair any project-related damage (in accordance with the Secretary of the Interior's standards) to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District.
- **CH 14** – reevaluate the Second and Howard Streets Historic District within 180 days of FTA's determination of project completion.

Proposed Project

Impact CR-1: The proposed project could cause a substantial adverse change in the significance of archaeological resources pursuant to Section 15064.5 of the CEQA Guidelines, but this potential effect would be avoided with modifications to the previously adopted mitigation measures for the Transbay Program. (No Adverse Effect/Less-than-Significant with Mitigation)

The proposed project components with a potential to disturb sediments to considerable depths may pose adverse effects on unknown archaeological resources and are similar to previous design components evaluated in the 2004 FEIS/EIR. Any potential adverse effect would be avoided and minimized through implementation of mitigation measures. No new or substantially more severe impacts have been identified or are anticipated to be identified, nor would these elements substantially change the severity or significance of the environmental impacts disclosed in the 2004 FEIS/EIR. There are no known archaeological resources or documented human remains within the proposed project footprint, as discussed below. Those proposed project components that would not involve extensive ground disturbance and/or involve sites that were previously disturbed are discussed in Appendix G.2 of this document, but are not summarized here because there is no potential effect related to these components.

Widened Throat Structure. The widened throat structure is adjacent to the Archaeological APE for the train box; thus, the conclusions of the Existing Transbay Transit Terminal and Ramp Demolition, Utility Relocation, New Transit Center Foundation Excavation (DURF) ARDTP are relevant for evaluating the archaeological sensitivity of the proposed project component footprint. The dune sand, marsh deposits, and top layer of Colma sand are all sensitive for prehistoric Native American archaeological deposits and human remains. The entire city block of First, Second, Howard, and Folsom Streets has been recorded as archaeological site CA-SFR-151/H. Although the boundaries of the APE of the widened throat structure passes through the western edge of this city block and archaeological site, the prehistoric interment discovered recently within the Phase 1 train box footprint lies outside of the widened throat structure APE (but less than two city blocks away). Limited archaeological testing of the central portion of the block, outside of the widened throat structure APE, has revealed both a prehistoric Native American shell midden and historic-era features such as privies and trash dumps dating to the 1860s through the 1906 earthquake and fires. Construction of the widened throat structure has the potential to impact as yet unknown archaeological resources and disturb human remains. A high potential exists for encountering as yet unknown prehistoric Native American archaeological resources and human remains, and later 19th century ground surfaces, building foundations, and hollow-filled features.

Extended Train Box. From approximately 6,000 years ago until the filling of this portion of the bay in the 1860s, the area that is now the APE would have been situated in the waters of Yerba Buena Cove. Geotechnical reports indicate a layer of fill at least 17 feet thick overlying a similarly thick layer of Bay Mud and an even thicker layer of marine sands. The recently discovered prehistoric burial at 55 feet below ground surface near Fremont Street was situated at the interface between Marine Sands and Lower Bay Mud. This interface is below the limits of the extended train box APE. Therefore, there is low potential for encountering buried prehistoric Native American deposits or human remains in primary context, or as secondary deposits in fill. The City considers both primary and secondary deposits as having potential eligibility for listing in the CRHR and NRHP. The area within the footprint primarily housed iron works, wood mills, storage yards, and warehouses after the land was filled, but construction of the 201 Mission building, which covers a majority of the APE, resulted in removal or destruction of a large part of the soils and fill within the horizontal and vertical APE. Construction of the extended train box has the potential to impact as-yet-unknown archaeological resources from the post-fill 19th century industries and warehouses that were once situated on the property.

Realigned Fourth and Townsend Station. There is very low potential for historic-era archaeological resources within the footprint of Townsend Street, which was established early in the history of the development of the City and is unlikely to contain historic-era deposits, features, or structural remains within the fill beneath the street surface. The APE lies in what was formerly the edge of Mission Bay and adjacent marshlands from between approximately 6,000 years ago until the 1860s, when the land was reclaimed by filling. Prior to approximately 6,000 years ago, before the waters of the bay reached their maximum extent, the APE would have been an attractive estuarine and marshy area accessible to prehistoric-era Native Americans to use and occupy. There is a moderate potential for encountering as-yet-unknown archaeological resources from the prehistoric era.

Vent Structure at 701 Third Street. This vent structure sits adjacent to the DTX alignment. No documented archaeological resources exist within the APE; therefore, the proposed project would not cause a substantial adverse change in the significance of unique archaeological resources. The site of the proposed vent structure is at the base of a hill immediately adjacent to the former edge of Mission Bay. The underlying stratigraphy is simple, with a relatively thin layer of fill (10 to 15 feet) overlying residual soil of varying thickness on top of bedrock. None of the layers sensitive for prehistoric Native American archaeological resources or human remains are present within the APE; therefore, there is no potential for encountering buried prehistoric Native American deposits or human remains in primary context, and there is only a very low potential for encountering such remains that may have been redeposited as fill. They could only exist as secondary deposits accidentally included in the fill in the 19th century. Nonetheless, the City considers such secondary deposits as having potential eligibility for listing in the CRHR and NRHP. The APE housed San Francisco Lumber Company by 1887, and there is a moderate potential for encountering as-yet-unknown archaeological deposits associated with this commercial enterprise during construction for the vent structure at 701 Third Street.

Alternate Vent Structure Location at 699 Third Street and 180 Townsend Street. Any archaeological sensitivity, or potential for significant buried prehistoric archaeological deposits, for the alternate location considered for a vent structure at the northeast corner of Third Street and Townsend Street would be approximately the same as the preferred site at the southeast corner. However, the potential for significant buried historic archaeological deposits may be considered higher at the alternate site because it falls within the South End Historic District, and, although the historic district is based on architectural qualities, archaeological deposits may be associated with significant buildings.

Vent Structure at Second and Harrison Streets. This vent structure is located adjacent to the tunnel at Second and Harrison Streets. The stratum underlying the APE consists of a 5-foot-thick layer of fill overlying bedrock. There are no native soils present within the APE; therefore, there is no potential for encountering buried prehistoric Native American deposits or human remains in primary context. There is also a very low potential for encountering such remains that may have been redeposited as fill; they could only exist as secondary deposits accidentally included in the fill in the 19th century. Nonetheless, the City considers such secondary deposits as having potential eligibility for listing in the CRHR and NRHP. The APE lies in the northwest corner of archaeological site CA-SFR-152H, and later 19th century historic-era features have been recovered during prior archaeological investigations outside of the APE. The APE is located at the edge of Rincon Hill, which housed large residences and stables in the days following the Gold Rush. However, with the Second Street Cut in 1868, which changed the feel of this once exclusive hillside neighborhood, the residences were razed, and only in the 20th century was the corner redeveloped for commercial uses. The potential exists for encountering as-yet-unknown archaeological remains from the pre-1868 residential occupation of the APE and the post-1913 commercial use of the APE.

Tunnel Stub Box. The tunnel stub box is located within the formerly submerged margin of Mission Bay near the mouth of Mission Creek. The greater Mission Creek and Mission Bay areas were attractive places that were likely fished and hunted by Native Americans for thousands of years, and the

geotechnical studies of the APE suggest that there is moderate potential for encountering prehistoric Native American archaeological deposits or human remains beneath the 10- to 20-foot-thick layer of fill. Archaeological deposits and human remains could either be in primary context in the Bay Mud, marine sands, and old bay clay beneath the fill, or in secondary context as part of the fill. The City considers both primary and secondary deposits as having potential eligibility for listing in the CRHR and NRHP. Given the depth of the Colma sand layer, it is possible that piles used to support the western end of the new train box may extend into Colma sand. The top layer of this sand is considered sensitive for archaeological deposits. Historically, the APE was part of a larger purchase by the Southern Pacific Railroad in 1868 and 1869 of former marsh and tidelands that the company gradually filled. The sole prior development within the footprint of the tunnel stub box is limited to the Southern Pacific railroad tracks, and the APE includes tracks that are currently in use. There is a very low potential for encountering as-yet-undiscovered archaeological resources from the historic period, and these would likely be related to the railroad. There is a moderate potential for encountering as-yet-unknown archaeological resources from the prehistoric period.

BART/Muni Underground Pedestrian Connector. Construction-related excavation would remove all sediments within the footprint to a depth of 30 feet at its maximum depth at the southern end of this proposed project component. The connector would be installed in a location where the waters of Yerba Buena Cove occurred between approximately 6,000 years ago and the 1860s. Geotechnical reports indicate a layer of fill at least 23 feet thick overlying a similarly thick layer of Bay Mud. With the exception of the fill, the depositional history of this APE is marine; therefore, there is very low potential for encountering buried prehistoric Native American deposits or human remains in primary context, and there is a low potential for encountering such remains that may have been redeposited as fill. Nonetheless, the City considers such secondary deposits as having potential eligibility for listing in the CRHR and NRHP. There is very low potential for encountering other historic-era archaeological resources within the confines of Beale Street, with the exception of the remains of a Gold-Rush-era ship, the *Callao*, which reportedly was broken and left in the intersection of Beale and Mission Streets during the filling of the cove margin following the Gold Rush.

Mitigation Measures. Mitigation Measures CH 15 through CH 20 previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project, would continue to apply and would be implemented and monitored for the proposed project. Therefore, potential effects would be reduced and no further mitigation would be needed. To adequately incorporate these measures to address the proposed project components, the following amendments are necessary to the archaeological resources treatment plan (see italicized text for additions and strikethrough text for deletions to previously adopted Mitigation Measure CH 16):

> **CH 16** ~~If the consulting parties agree that a treatment plan for archaeological properties should be prepared,~~ *The TJPA shall* prepare a Treatment Plan *(an updated Demolition, Utility Relocation, New Transit Center Foundation Excavation Archaeological Research Design and Treatment Plan [DURF ARDTP])* that provides for the identification, evaluation, and treatment of archaeological properties that may be affected by the project and that ~~conform to the requirements above of item CH 13 1)~~ ~~and~~ takes into account the information contained in items CH 13 ~~2)~~ and CH 13, ~~3)~~ and conforms to any other standards, documentation, or guidance that the *signatories* ~~consulting parties~~ may specify. *This updated DURF ARDTP will include the locations of the widened throat structure, extended train box, and BART/Muni underground pedestrian connector, and ensure that the DTX ARDTP, which has not yet been prepared, includes the realigned Fourth and Townsend Street Station, vent structures at Third and Townsend and at Second and Harrison Streets, and the tunnel stub box.*

If the *signatories* ~~consulting parties~~ agree that the ~~Treatment Plan~~ *DURF ARDTP and DTX ARDTP* will address historic archaeological properties as well as prehistoric archaeological properties, ensure that appropriately qualified historians prepare a historic context(s) that will be used by an interdisciplinary team consisting at a minimum of historians and historic archaeologist.

The historic context will, at a minimum:

1) identify significant research themes and topics that relate to the historic period(s) addressed by the historic context(s)

2) determine what types of historic archaeological properties, if any, that may usefully and significantly contribute to research themes and topics deemed by the historic context(s) study to be important

3) identify the specific components and constituents (features, artifacts, etc., if any, of historic archaeological property types that can factually and directly, contribute data important to our understanding of significant historic research themes and topics

4) determine the amount (sample size, etc.) of archaeological excavation and related activity that is needed to provide the range and type of factual data that will contribute to our understanding of significant historic research themes and topics

Submit the ~~draft Treatment Plan~~ *updated DURF ARDTP and draft DTX ARDTP* to the ~~other consulting parties~~ *signatories* for review and comment. ~~The consulting parties~~ *They will* have 45 days from receipt of the ~~draft Treatment Plan~~ *updated DURF ARDTP and draft DTX ARDTP* to comment in writing to FTA and TJPA. Failure ~~of the consulting parties~~ to respond within this time frame shall not preclude FTA and TJPA from finalizing ~~the draft Treatment Plan~~ *these documents* to their satisfaction. Before finalizing the ~~draft Treatment Plan~~ *updated DURF ARDTP and draft DTX ARDTP*, FTA and TJPA to provide the ~~consulting parties~~ *signatories* with written documentation indicating whether and how the ~~draft Treatment Plan~~ *updated documents* will be modified. Unless any ~~consulting~~ *signatory* party objects to this documentation in writing to FTA and TJPA within 15 days following receipt, finalize the ~~draft Treatment Plan~~ *updated DURF ARDTP and draft DTX ARDTP* as deemed appropriate by FTA and TJPA, and proceed to implement the ~~final Treatment Plan~~ *updated DURF ARDTP and final DTX ARDTP*.

If FTA and TJPA propose to modify the ~~final Treatment Plan~~ *updated DURF ARDTP and DTX ARDTP,* they will notify the ~~consulting parties~~ *signatories* concurrently in writing about the proposed modifications. The ~~consulting parties~~ *signatories* will have 15 days from receipt of notification to comment in writing to FTA and TJPA. Failure ~~of the consulting~~ *parties* to respond within this time frame shall not preclude FTA and TJPA from modifying the ~~final Treatment Plan~~ *updated DURF ARDTP and DTX ARDTP* to their satisfaction.

Before modifying the ~~final Treatment Plan~~ *updated DURF ARDTP and DTX ARDTP,* FTA and TJPA will provide the ~~consulting parties~~ *signatories* with written documentation indicating whether and how the ~~final Treatment Plan~~ *updated DURF ARDTP and DTX ARDTP* will be modified. Unless any ~~consulting party~~ *signatory* objects to this documentation in writing to FTA and TJPA within 15 days following receipt, modify the ~~final Treatment Plan~~ *updated DURF ARDTP and DTX ARDTP* as appropriate, and proceed to implement the modified final ~~Treatment Plan~~ *documents*.

These amendments to the existing mitigation measures would reduce the potential adverse NEPA effects and also would reduce the potentially significant CEQA impact to a less-than-significant level.

Impact CR-2: The proposed project could cause direct adverse impacts on historic architectural resources, but this potential effect would be avoided with modifications to the previously adopted mitigation measures for the Transbay Program. (No Adverse Effect/Less-than-Significant with Mitigation)

Widened Throat Structure. The proposed widened throat structure has the potential to directly impact historic architectural resources where cut-and-cover construction activities extend farther east than the construction activities evaluated in the 2004 FEIR/EIS. This shift and expansion of the throat structure at the west end of the train box would have the potential to cause vibration impacts to buildings that were previously farther removed from those construction activities.

The additional area of the widened throat structure would extend underneath portions of the five-story building at 589 Howard Street, a contributor to the Second and Howard Street NRHP District, a NHPA/CEQA historic property (City of San Francisco 2012b). The impact on this structure in the 2004 FEIS/EIR was limited to the recognition that once the three buildings to the north of 589 Howard Street were demolished, 589 Howard Street would be visually isolated from the rest of the Second and Howard Streets Historic District. The 2007 revisions to the Mitigation Monitoring and Reporting Program (MMRP) (TJPA 2007), which is reproduced in Appendix C of this SEIS/EIR, recognized the potential for construction-related damage as well, and 589 Howard Street was added to the properties covered by Mitigation Measure CH 11, which specifies protective measures to be implemented, monitored, and supplemented as needed. However, the widened throat structure would pass under a portion of the building.

Because demolition of the northwest portion of 589 Howard Street would constitute a direct adverse impact on a historic property, the following construction methods have been included as part of the project to avoid this impact. Two large-diameter cast-in-drilled-hole piles would be installed on the north and west sides of the building. A beam would be inserted to span the piles, and the piles and the underpinning beam would support the building during construction. With the addition of underpinning, the construction-induced vibration has a very low potential of causing structural damage to 589 Howard Street. If damage occurs during construction of the widened throat structure or installation of the underpinning, the damage would constitute a direct adverse impact on the historic property.

The building at 165-173 Second Street (the current street address is 171 Second Street), a contributor to the Second and Howard Street NRHP District, a NHPA/CEQA historic property, was identified in the 2004 FEIR/EIS for demolition. With the shift of the proposed widened throat structure to the east, it would no longer be necessary to demolish the building, and this direct adverse impact on a historic property would be avoided. The same construction methods applied to 589 Howard Street would be implemented for 165-173 Second Street. With the addition of underpinning, the construction-induced vibration would have a very low potential to cause structural damage to 165-173 Second Street. If damage occurred during construction of the widened throat structure or installation of the underpinning, the damage would have a direct adverse effect on the historic property. In addition, the demolition of 165-173 Second Street was identified in the 2004 FEIR/EIS as having an indirect adverse effect on 163 Second Street, a contributor to the Second and Howard Street NRHP District, a NHPA/CEQA historic property. Because no demolition would occur, the proposed project would avoid the indirect adverse effect on 163 Second Street.

Mitigation Measures CH 11 and CH 13, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project, would continue to apply and would be implemented and monitored for the

proposed project. Therefore, the impact would be reduced and no further mitigation would be needed. Mitigation Measure CH 11 specifies protective measures to be developed, implemented, monitored, and supplemented where necessary, and Mitigation Measure CH 13 specifies standards and procedures for repairing inadvertent damage caused by the project. In addition, mitigation measures previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project for geology, soils, and seismicity (SG 1, SG 2, SG 4, and SG 5) and for vibration control during construction (VibC 1, VibC 2, and VibC 3) would further reduce potential effects associated with construction activities at and around 589 Howard Street and 165-173 Second Street. The full text for these measures is presented in Appendix C of this SEIS/EIR. Finally, as described under Impact C-NO-4 in Section 3.12, Noise and Vibration, of this SEIS/EIR, construction vibration impacts of the proposed project can be mitigated by amending the 2004 FEIS/EIR mitigation measures to acknowledge historical resources.

There are two features of the San Francisco Fire Department AWSS, a NHPA/CEQA historic property located underground at the intersection of Second and Howard Streets: an 18-inch-diameter pipe running underneath Second Street and a 12-inch-diameter pipe underneath Howard Street. According to the Second Street Utility Relocation Details drawing (Parsons 2010), the 18-inch-diameter pipe underneath Second Street would be taken out of service temporarily and replaced with a new 18-inch-diameter pipe at the completion of the DTX project. The 12-inch-diameter pipe underneath Howard Street would be taken out of service temporarily. The Department of Parks and Recreation 523D form for the AWSS lists the primary character-defining features of the historic district as the system's function and its engineering design and plan. Approximately 135 miles of pipes are in the AWSS historic district. Replacement of a relatively small segment of pipe and taking another segment out of service (together totaling less than 1 mile) would not constitute a direct adverse effect on the historic property, because their removal would not impair the district's ability to convey its historical significance, nor would it alter the district's eligibility status.

Extended Train Box. Components of the San Francisco Fire Department AWSS, a NHPA/CEQA historic property/historical resource, are located in the area of this proposed project component and could be removed or relocated during project activities. However, similar to the impact discussion for the widened throat structure, protection or relocation of AWSS components in a relatively small area of a system that spans the entire City would not constitute a direct adverse effect on the historic property. The additional area affected by the extension of the train box, where the AWSS would be found, would be limited to the Beale Street right-of-way, or approximately 50 feet, compared to the 135 miles making up the system. The area surrounding the proposed project component consists of mainly newer buildings (less than 45 years old), so no historic architectural resources would be indirectly affected. Before disturbance of the AWSS, coordination with the SFPUC and TJPA would occur. The SFPUC provides the proper guidance of maintaining the resource through design guidelines and/or leave and protect in-place methods. Written and documented consultation with the SFPUC is required prior to the disturbance of AWSS facilities.

Realigned Fourth and Townsend Street Station. The Caltrain station site has been found ineligible for the NRHP (City of San Francisco 2001); thus, no potential exists for direct or indirect adverse impacts related to the realigned Fourth and Townsend Street Station.

The NRHP- and CRHR-eligible Bluxome and Townsend Warehouse Historic District is located to the northwest, and the South End Historic District and Rincon Point/South Beach Historic Industrial/Warehouse District is east of the proposed realigned station that would be underground, beneath Townsend Street. This proposed project component would not impede sight lines from the historic district to the railyard, and would not indirectly impact the historic districts because it would be underground. Furthermore, there is no new future development planned by the TJPA that may impact either of these historic districts.

The City is studying potential development opportunities that would be co-located with the vent structures and along the south side of the realigned Fourth and Townsend Street Station; however, this study has only recently been initiated and there are no details that would enable any analysis of the City's proposals on the nearby historic districts. The potential impacts of this future development would be evaluated in the City's own environmental document at a later date. Therefore, the realigned station would have no adverse effect on the Bluxome and Townsend Warehouse Historic District, and no effect on the South End Historic District and Rincon Point/South Beach Historic Industrial/Warehouse District.

Vent Structures. The vent structures are described below with their potential to affect historic architectural resources or districts.

Vent Structures at Fourth and Townsend Streets and at Fifth and Townsend Streets. The two vent structures proposed to be located at the realigned Fourth and Townsend Street Station have no potential to directly impact historic architectural resources because there are no buildings at the proposed sites. The Caltrain station site was found ineligible for the NRHP (City of San Francisco 2001); thus, no potential exists for indirect adverse impacts on the Caltrain station.

The NRHP- and CRHR-eligible Bluxome and Townsend Warehouse Historic District is located northwest of the proposed project vent structure sites. Construction of the proposed vent structures would not substantially alter the relationship between the buildings of the district and the rail tracks—a relationship that, in part, helps to define the historic district's significance—because the new structures would be constructed at a sufficient distance from the district (the nearest vent structure to the district would be the one at the west end of the station, or approximately 100 feet away) and would be relatively small in size (approximately 35 feet by 35 feet, based on the vent structure plans at Third and Townsend Streets that are expected to be similar to those for the vent structure at the Fourth and Townsend Street Station), which would avoid impeding sight lines from the historic district to the railyard (see Figure 3.6-1). Therefore, construction of the proposed vent structures would not constitute an indirect adverse effect on the Bluxome and Townsend Warehouse Historic District. Similarly, the South End Historic District and the Rincon Point/South Beach Historic Industrial/Warehouse District are one block east of the proposed vent structures, but far enough away (more than 800 feet) that the setting of those districts would not be indirectly affected by the proposed project. Therefore, the vent structures associated with the Fourth and Townsend Station would have no effect on these historic districts.

As noted above under the analysis of the realigned Fourth and Townsend Street Station, there is no new future development planned by the TJPA that may impact any of these historic districts. The City is studying potential development opportunities that would be co-located with the vent structures and along the south side of the realigned Fourth and Townsend Street Station. The potential impacts of this future development would be evaluated in the City's own environmental document when the City determines that environmental review is timely.

Vent Structure at Third and Townsend Streets: 701 Third Street. The proposed vent structure at 701 Third Street has no potential to directly impact historic architectural resources. The site currently contains a fast food restaurant (constructed in 1970), which would be demolished to make way for the vent structure. The fast food restaurant was found to be ineligible for listing in any register through survey evaluation and is not considered a historic property (Page & Turnbull 2010), so that demolition would not constitute a direct impact. The buildings surrounding the proposed project site to the south, east, and west were constructed in the past 10 years and are not considered historic architectural resources.

The two buildings across Townsend Street to the north (689–699 Third Street and 180 Townsend Street) are located within the South End Historic District and Rincon Point/South Beach Historic Industrial/ Warehouse District. Construction of a new vent structure and new adjacent mixed-use development

consistent with City zoning regulations would not constitute a substantial change from existing contextual conditions, so there would be no indirect impacts to the historic districts located across the street.

Alternate Vent Structure Location at Third and Townsend Streets: 699 Third Street and 180 Townsend Street. The alternate location considered for a vent structure at Third Street and Townsend Street would require the demolition of buildings located within the South End Historic District and Rincon Point/South Beach Historic Industrial Warehouse District.

Of the two buildings that would be demolished, the 1903–1905 California Wine Association Building at 180 Townsend was identified as a contributor to the South End Historic District. The building located at 687–699 Third Street was identified as a non-contributor to the South End Historic District in the National Register Certification prepared by Page & Turnbull and certified by the National Park Service in 2008 (Lapsley 2008; Page & Turnbull 2010). In the 2008 update to the historic district, the National Park Service certified that of the 78 buildings located within the historic district boundaries, 55 buildings contribute to the historic district and 23 buildings are non-contributors.

The demolition of one contributor and one non-contributor would not result in a significant impact on the South End Historic District because the historical integrity of the district would remain strong as a whole, with 54 remaining contributors and with the retention of a strong row of contributing buildings to the east of 180 Townsend to Second Street. However, the introduction of the vent structure at this corner location at the edge of the historic district could result in a significant impact, unless the new design follows accepted preservation standards for context-sensitive infill development in historic districts, such as the S*ecretary of the Interior's Standards for the Treatment of Historic Properties*.

The loss of two buildings located within the Rincon Point/South Beach Historic Industrial Warehouse District combined with the introduction of a new structure at this corner location along the boundary of the district would not result in a significant impact, because TJPA will require that the new design follows the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Mitigation Measure CH 12, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project, would continue to apply and would be amended to include the documentation of 180 Townsend prior to demolition.

Vent Structure at Second and Harrison Streets. Proposed development at Second and Harrison Streets was previously cleared in the 2004 FEIS/EIR and it is assumed for the purposes of this analysis that the development would be constructed on an existing parking lot, so there is no potential for direct impacts from that development or the proposed co-location of a vent structure at this site to historic architectural resources. The building to the immediate south of the proposed project site (425 Second Street, constructed in 1919) and the building directly across Second Street to the west (400 Second Street, constructed in 1917) are considered CEQA historical resources; both buildings have been determined individually eligible for the CRHR. The building at 425 Second Street was identified in the South of Market Survey as an industrial-type building that can be eligible for the CRHR under CRHR Criterion 1 (Event) for an association with "post-1906 history as a predominantly light industrial district of small factories, shops, warehouses, and infrastructure serving these uses" (Page & Turnbull 2010). It is eligible under Criterion 3 (Design/Construction) as an example of the "dominant building type in much of the neighborhood … one- to six-story concrete or brick industrial buildings constructed between 1906 and 1914 and during the 1920s, with a handful of outliers constructed during the 1930s (Page & Turnbull 2010).

Construction of a vent structure adjacent to 425 Second Street would not be anticipated to adversely impact the building, which would continue to retain high integrity of design, association, and feeling.

Integrity of setting would be compromised somewhat, but the area has already seen new development in recent years, including the building immediately northeast of the proposed site (575 Harrison Street, built in 1999). The proposed new structure would not substantially alter the integrity of the current setting. Integrity of location would not change because the historical resource would remain at its original site. Therefore, the proposed vent structure would not result in an indirect effect on the historical resource at 425 Second Street.

The building at 400 Second Street was identified in the South of Market Survey as a commercial-type building. Page & Turnbull defined the significance criteria for commercial-type buildings similarly to industrial-type buildings. The building at 400 Second Street would continue to convey its significance through integrity of design, materials, and workmanship if the proposed vent structure were constructed. Furthermore, integrity of association, feeling, location, and—to a certain extent—setting would be retained. Consequently, the proposed vent structure would not result in an indirect effect on the historical resource at 400 Second Street.

The South End Historic District and Rincon Point/South Beach Historic Industrial/Warehouse District (NRHP-eligible districts) are one block south of the proposed project vent structure. However, the proposed project component site and the historic districts are sufficiently separated to be spatially out of view of each other (about 250 feet with the elevated I-80 in between), and construction of this proposed project component would not cause an indirect effect on the nearby historic districts.

Vent Structures at Second and Natoma Streets. The proposed vent structures at Second and Natoma Streets have no potential to directly impact historic architectural resources because there are no buildings located at the site. The proposed vent structures/cooling tower would be approximately 14 feet in diameter and 12 feet tall, and would be incorporated into the new Transit Center, which was previously determined in the 2004 FEIS/EIR and Finding of Effect: Locally Preferred Alternative (Peninsula Corridor Joint Powers Board 2003) as having no indirect impacts on adjacent historic architectural resources, specifically the Second and Howard Streets Historic District and New Montgomery-Mission-Second Street Conservation District. If the new multi-story Transit Center was determined to not have indirect impacts on historic architectural resources, it is reasonable to conclude that the proposed vent structure would likewise not cause an indirect effect on those same historic districts. The other two vent structures at this location would be exhaust fans that would be below-grade facilities constructed to exhaust at the street level. Since no portion of these fans would project above-grade, they would not indirectly affect the two nearby historic districts.

Vent Structure at Natoma and Main Streets. The proposed vent structure at Natoma and Main Streets has no potential to directly or indirectly impact historic architectural resources. The buildings surrounding the proposed new structure are not considered historic architectural resources. The area consists of newer buildings (less than 45 years old), so that there are no historic architectural resources present that could be directly or indirectly affected.

Tunnel Stub Box. The proposed tunnel stub box has no potential to directly or indirectly impact historic architectural resources. This proposed project component involves below-grade construction under an already-approved U-wall at the west end of the Caltrain railyard. The Caltrain railyard was found ineligible for the NRHP (City of San Francisco 2001), so that there is no potential for construction activities to directly or indirectly impact a historic property located above the construction area. Furthermore, the Finding of Effect: Locally Preferred Alternative (Peninsula Corridor Joint Powers Board 2003) determined that new construction at the Caltrain site, specifically project components that are "similar in visual character to those existing at these sites, such as ... station structures" would not result in adverse visual (indirect) effects, so there is no potential for the tunnel stub box to indirectly impact surrounding historic architectural resources.

Intercity Bus Facility. The proposed intercity bus facility has no potential to impact historic architectural resources. The intercity bus facility would be a new, two-story structure behind (south of) 201 Mission Street. Two levels of residential or office development above the intercity bus facility are also included as part of the proposed project for CEQA purposes. Even with full buildout at this site, there is no potential for direct or indirect impacts to historic architectural resources because all the buildings surrounding the proposed intercity bus facility are less than 45 years of age and are not historic architectural resources.

Bicycle/Controlled Vehicle Ramp. The proposed bicycle/controlled vehicle ramp and below-grade bicycle facilities have no potential to directly impact historic architectural resources because no historic architectural resources are present at this location. The proposed bicycle/controlled vehicle ramp would descend from street level at Howard Street north to the Lower Concourse level of the Transit Center, with no above-grade elements. Its integration into the Transit Center, which was already found to be of similar scale and function as its surroundings, would not result in an indirect effect on surrounding historic architectural resources, especially the buildings listed as contributors to the Second and Howard Streets Historic District and New Montgomery-Mission-Second Street Conservation District.

BART/Muni Underground Pedestrian Connector. It is possible that components of the San Francisco Fire Department AWSS, a NHPA/CEQA historic property located in the area of this proposed project component, could be removed or damaged during project construction-related activities. Similar to the impact discussions for the widened throat structure and the train box extension, removal or damage of AWSS components in a relatively small area of a system that spans the entire City would not constitute a direct adverse effect on the historic property. The proposed underground pedestrian connector would be approximately 800 feet in length, and disturbance of this length of pipeline would not compromise the integrity of the 135-mile AWSS. Because the proposed project component would be constructed underneath the Beale Street right-of-way, there is no potential for construction to indirectly impact historic architectural resources on Beale Street.

Mitigation Measures. Mitigation Measure CH 11 requires the preparation of studies to document the pre-construction condition of the building, a process for monitoring the condition of the building during construction, and the development of protective measures to prevent damage during construction. This measure already applies to 589 Howard Street and 165-173 Second Street, and includes protective measures for "damage caused by any aspect of the project." Thus, this measure would continue to apply. Mitigation Measure CH 13 requires plans for repair of inadvertent damage that may occur in specified historic districts, and would be amended to include the same requirements for 589 Howard Street and 165-173 Second Street, as follows (see italicized text for additions to previously adopted Mitigation Measure CH 13):

> **CH 13** – Repair, in accordance with the Secretary of the Interior's Standards for Rehabilitation, any damage to contributing elements of the Second and Howard Streets Historic District, the Rincon Point/South Beach Historic Warehouse Industrial District, *589 Howard Street, and 165-173 Second Street* resulting from the Project.
>
> Photograph the condition of the contributing elements prior to the start of the Project to establish the baseline condition for assessing damage. Consult with property owner(s) about the appropriate level of photographic documentation of building interiors and exteriors. Provide a copy of this photographic documentation to the property owner(s), and retain on file.
>
> Submit repair plans and specifications to SHPO for review and comment, if repair of inadvertent damage resulting from the Project is necessary, to ensure that the work conforms to the Secretary of the Interior's Standards for Rehabilitation. Consult with SHPO to establish a mutually satisfactory

time frame for the SHPO's review. TJPA will carry out any repairs required hereunder in accordance with the comments of SHPO.

The NEPA effects of demolition of a contributor to the South End Historic District (180 Townsend Street) would be mitigated by amending Mitigation Measure CH 12 to include HABS documentation of 180 Townsend Street and would remove 165-173 Second Street, because it would no longer be demolished but would be preserved under the proposed project. This also would reduce the CEQA impact on the Rincon Point/South Beach Historic Industrial Warehouse District, but the impact would still be significant. Mitigation Measure CH 12 would be amended as follows (see italicized text for additions and strikethrough text for deletions to previously adopted Mitigation Measure CH 12):

CH 12 – TJPA will take the effect of the Project on the three historic properties listed below into account by recording these properties in accordance with the terms herein set forth. These buildings are:

- 191 2nd Street, (APN: 3721-022), and
- 580-586 Howard Street, (APN: 3721-092 through 3721-106), and
- ~~165-173 2nd Street, (APN: 3721-025),~~
- *180 Townsend Street*

Prior to taking any action that could adversely affect these properties, consult SHPO and SHPO will determine the type and level of recordation that is necessary for these properties. Upon a written determination by SHPO that all documentation prescribed hereunder is complete and satisfactory, submit a copy of this documentation to SHPO, with xerographic copies to the History Center at the San Francisco Public Library, San Francisco Architectural Heritage, and the Oakland History Room of the Oakland Public Library. Thereafter, proceed with that aspect of the Project that will adversely affect the historic properties documented hereunder.

If SHPO does not respond within 45 days of receipt of each submittal of documentation prescribed herein, assume that SHPO has determined that said documentation is adequate and may proceed with that aspect of the Project that will adversely affect the historic properties documented hereunder.

Impact C-CR-3: The construction activities for the proposed project would not result in a substantial adverse change in the significance of a historical resource. (No Effect/No Impact)

Construction activities for the proposed project would not result in a substantial adverse change to historical resources beyond those identified under Impact C-CR-1 and Impact C-CR-2. The impacts associated with construction of the proposed project would be permanent impacts that extend beyond the period of construction; these are addressed in Impact CR-1 for archaeological resources and Impact CR-2 for historic architectural resources. No construction activities would cause only temporary impacts to cultural resources during the construction period, because any such construction impacts to cultural resources would result in either destruction of buried archaeological resources, damage to architectural and structural resources, or the permanent introduction of new development in the setting of historic districts.

Impact C-CR-4: The proposed project could result in damage or destruction of previously unknown unique paleontological resources during construction-related activities, but this potential effect would be avoided by proposed preconstruction mitigation. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

Fossilized remains of a mammoth were unearthed in the project area in September 2012, leading to a determination that the project area possesses a high potential to contain additional such fossils. Therefore, construction activities involving ground disturbance could damage or destroy previously unknown, unique paleontological resources. These proposed project components include the widened throat structure, extended train box, the vent shafts and emergency exits, the BART/Muni underground pedestrian connector, bicycle/controlled vehicle ramp, and the tunnel box stub. Conversely, several proposed project components would not entail ground disturbance and would not result in the damage or destruction of such resources. Those proposed project components include the intercity bus facility, taxi staging area, and AC Transit bus storage facility parking.

Mitigation Measure. Implementation of New-MM-C-CR-4.1 would reduce the potential adverse NEPA effect to no adverse effect and also would reduce the potentially significant CEQA impact to a less-than-significant level.

New-MM-C-CR-4.1 *Minimize Potential Impacts to Paleontological Resources.* To minimize potential adverse impacts on previously unknown, potentially unique, scientifically important paleontological resources, the TJPA shall do the following:

- Before the start of any earthmoving activities, the TJPA shall retain a qualified paleontologist to train all construction personnel involved with earthmoving activities, including the project superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and the proper notification procedures should be followed if fossils are encountered.

- The construction crew shall immediately cease ground-disturbing work in the vicinity of the find and notify the TJPA.

- The TJPA shall retain a qualified paleontologist to evaluate the resource and prepare a recovery plan, in accordance with Society of Vertebrate Paleontology guidelines (SVP 1995). The recovery plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Necessary and feasible recommendations in the recovery plan shall be implemented before construction activities are resumed at the site where the paleontological resource was discovered.

Cumulative Analysis

Impact CU-CR-5: The proposed project in combination with other past, present, and reasonably foreseeable development would not result in adverse cumulative effects on archaeological resources. (No Adverse Effect/Less-than-Significant Impact)

The geographic context for this cumulative historic and cultural resource analysis includes the Transbay Program, Transit Center District Plan, and the Central SoMa Plan which include the neighborhoods which may be affected by the proposed project.

No cumulative impacts to archaeological resources are anticipated beyond impacts identified for the proposed project, because effects are typically considered on a site-by-site basis for archaeological resources, as indicated by the 2012 Transit Center District Plan and Transit Tower FEIR (City of San Francisco 2012a), a project of greater scope and potentially greater impacts on archaeological resources within the same South of Market district. The 2004 FEIS/EIR determined that the Transbay Program would not have the potential to result in cumulative impacts on archaeological resources. The proposed project would result in similar, but smaller-scale, impacts, as described in the 2004 FEIS/EIR, and would similarly have no cumulative impacts to archaeological resources.

Impact CU-CR-6: The proposed project in combination with other past, present, and reasonably foreseeable development would not result in an adverse cumulative effects on historical resources. (No Adverse Effect/Less-than-Significant Impact)

The area south of Market Street has experienced substantial commercial and residential development over the past decade. Development pressures have led to the loss of historical resources, and the City has responded by overseeing several comprehensive preservation planning efforts in the area. Three major historic resources surveys have been conducted to establish a better baseline for identification of historic properties so that their protection can be considered as part of the City's local project environmental reviews. The Transbay Survey (Kelley & VerPlanck 2008) focused on the South of Market area bounded by Market, Main, Tehama, and New Montgomery Streets; an update to the survey (City of San Francisco 2012b) resulted in a more complete picture regarding eligibility of all historic-age properties in the survey area. The South of Market Survey (Page & Turnbull 2010) covered an area bounded roughly by Market and Townsend Streets between First and 13th Streets, and evaluated approximately 1,600 properties constructed in or before 1962.

The San Francisco Planning Code Article 10 process for considering project impacts on historical resources, combined with the improved baseline planning information, would reduce the likelihood of cumulative impacts to historical resources in the cumulative project area by imposing limitations during the entitlement process that deter projects that would adversely impact historical resources. The proposed project has little potential to contribute to cumulative impacts in the area, because the proposed project would require no demolition of individually eligible historic architectural resources, minimal new infill in areas that already contain recently constructed buildings, and minimal potential damage of AWSS components in a small area of a citywide system, which includes one reservoir, two storage tanks, two pump stations, 172 cisterns, and approximately 135 miles of pipes. Other proposed project components are underground, and would not contribute to cumulative impacts to historic resources, or are located in areas that were already analyzed in the 2004 FEIS/EIR for which no significant cumulative effects were identified. Only a small number of projects actually would cut across or go under pipelines that run in the public right-of-way. Most of the development projects would affect a particular parcel and would not extend into or under the public right-of-way.

As a result, the proposed project in combination with other past, present, and reasonably foreseeable development would not result in adverse or significant cumulative effects to historical resources.

Impact CU-CR-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on paleontological resources. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

Foreseeable development throughout the City, and particularly along the former waterfront, has the potential for ground disturbance. Such projects have the potential to encounter paleontological resources. Fossil discoveries resulting from excavation and earthmoving activities are occurring more frequently throughout California. The scientific value of fossils depends on the age and depositional environment of the rock unit that contains the fossil, the rarity of the fossil, and the extent of previous identification and documentation. Because the proposed project could result in discovery of fossilized remains, and because other similar construction activities throughout the Bay Area in areas with rock units that are of a sedimentary nature could also affect paleontological resources, there is potential for cumulatively adverse effects.

Implementation of New-MM-C-CR-4.1 would reduce potentially significant project-related impacts that would cause damage or destruction of unique paleontological resources to a less-than-significant level. This mitigation measure requires that construction workers be alerted to the possibility of encountering paleontological resources, and thereby avoid the destruction of such resources during earth-moving activities (primarily associated with heavy machinery). Fossil specimens would be collected and appropriately curated. Therefore, the proposed project would not result in a cumulatively considerable contribution to a potentially significant cumulative impact related to paleontological resources. This cumulative impact would, therefore, be not adverse/less than significant.

3.6.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Historic and Cultural Resources (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that a significant and unavoidable adverse effect would occur from demolition of three NHPA historic properties and other historical resources. The proposed project analyzed in this SEIS/EIR would have no effect because construction activities would cause only temporary impacts on cultural resources. The proposed project could, however, result in new adverse effects on historical resources not identified in the 2004 FEIS/EIR because of the potential to directly affect historic architectural resources from vibration (widened throat structure), the potential for unanticipated damage during construction to historic properties (underpinnings under 589 Howard Street and 165-173 Second Street), and the direct effect on a historic property (alternate location for vent structure at Third and Townsend Streets). Such effects would be reduced to no adverse effect through implementation of mitigation measures CH 1 through CH 20, adopted and incorporated into the Transbay Program as part of the 2004 FEIS/EIR as amended in this SEIS/EIR. The proposed project also would eliminate an adverse effect on historical resources identified in the 2004 FEIS/EIR because demolition of 163 Second Street would no longer be necessary with the shift of the proposed widened throat structure. As a result, the proposed project effects on archaeological, historic architectural properties, and other historical resources would not be adverse with mitigation. The 2004 FEIS/EIR did not specifically address paleontological resources. The proposed project analyzed in this SEIS/EIR could result in an adverse effect not identified in the 2004 FEIS/EIR related to paleontological resources if ground-disturbing construction activities damaged or destroyed previously unknown, unique paleontological resources. However, with implementation of New-MM-C-CR-4.1, this potential adverse effect could be avoided and minimized. As a result, the proposed project effects on paleontological resources would not be adverse.

CEQA Summary	
Impact CR-1: Archaeological Resources (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that no known prehistoric archaeological sites are documented within the APE; however, unidentified sites may exist and could be affected by project implementation, resulting in a potentially significant impact on unknown archaeological resources. With mitigation, the 2004 FEIS/EIR concluded that a less-than-significant impact would occur on unknown archaeological resources. The proposed project analyzed in this SEIS/EIR would result in the same significant impact identified in the 2004 FEIS/EIR related to potential disturbance on unknown archaeological resources. Therefore, the proposed project would not change the significance conclusion in the 2004 FEIS/EIR. With implementation of Mitigation Measures CH 15 through CH 20 adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program, as amended by the SEIS/EIR, the impact of the proposed project would be less than significant.
Impact CR-2: Historic Architectural Resources (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that a significant and unavoidable impact would occur from demolition of three NHPA historic properties and other historical resources, even after mitigation. The proposed project analyzed in this SEIS/EIR would result in new potentially significant impacts on historical resources not identified in the 2004 FEIS/EIR because of the potential to directly affect historic architectural resources from vibration (widened throat structure), the potential for unanticipated damage during construction on historic resources (underpinnings under 589 Howard Street and 165-173 Second Street), and a direct impact on the Rincon Point/South Beach Historic Industrial Warehouse District (alternate location for vent structure at Third and Townsend Streets). However, these impacts would not worsen or change the impact significance identified in the 2004 FEIS/EIR and would be reduced to a less-than-significant level with mitigation measures adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program (i.e., Mitigation Measures CH 11 through 13, as amended by the SEIS/EIR, and Mitigation Measures SG 1, SG 2, SG 4, SG 5, VibC 1, VibC 2, and VibC 3). The proposed project also would avoid a significant and unavoidable impact on historical resources identified in the 2004 FEIS/EIR because demolition of 163 Second Street would no longer be necessary with the shift of the proposed widened throat structure.
Impact C-CR-3: Construction – Historical Resources (No Impact)	The 2004 FEIS/EIR concluded that a significant and unavoidable impact would occur from demolition of three NHPA historic properties and other historical resources. The proposed project analyzed in this SEIS/EIR would have no impact because construction activities would cause only temporary impacts on cultural resources; the impacts associated with construction of the proposed project would be permanent impacts that would extend after completion of construction, as described under Impact CR-1 and Impact CR-2. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact C-CR-4: Construction – Paleontological Resources (Less than Significant with Mitigation)	The 2004 FEIS/EIR did not specifically address paleontological resources. The proposed project analyzed in this SEIS/EIR would result in a potentially significant impact not identified in the 2004 FEIS/EIR related to paleontological resources. With implementation of New-MM-C-CR-4.1, the impact of the proposed project would be mitigated to a less-than-significant level.
Impact CU-CR-5: Cumulative – Archaeological Resources (Less than Significant)	The proposed project in combination with other reasonably foreseeable development would result in less-than-significant cumulative archaeological resource impacts. The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.
Impact CU-CR-6: Cumulative – Historical Resources (Less than Significant)	The proposed project in combination with other reasonably foreseeable development would result in less-than-significant cumulative historical resource impacts. The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.
Impact CU-CR-7: Cumulative – Paleontological Resources (Less than Significant with Mitigation)	The 2004 FEIS/EIR did not specifically address paleontological resources. Without mitigation, the proposed project could result in a potentially cumulatively considerable effect related to paleontological resources. With implementation of New-MM-C-CR-4.1, the proposed project would not have a cumulatively considerable effect on these resources and the cumulative effects would be less than significant.

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3.7 BIOLOGICAL RESOURCES

3.7.1 Introduction

This section describes the existing biological setting of the highly urbanized South of Market (SoMa) area. Existing wildlife and plant species, including special-status species, and sensitive habitats, such as wetlands, waterways, and wildlife refuges, are described. Potential changes to biological species or habitats resulting from implementation of the proposed project are also identified. In particular, the analysis focuses on proposed project component locations and whether biological resources are present and/or if conditions have changed since approval of the 2004 FEIS/EIR.

3.7.2 Affected Environment

Vegetation

The project area is highly developed and dominated by paved roads, buildings, and concrete. Furthermore, a number of residential and commercial developments have been constructed since certification of the 2004 FEIS/EIR, resulting in more dense development than was present in 2004.

Areas of vegetation in the project area consist mostly of street trees and landscaping associated with commercial and residential developments. As a result, no sizable natural habitat for plant, animal, or bird species is present. Such vegetated areas generally provide habitat for species habituated to urban life and high disturbance levels, such as European starling (*Sturnus vulgaris*), white-crowned sparrow (*Zonotrichia leucophrys*), rock dove (*Columba livia*), and hummingbird (*Trochilidae* sp.) (City of San Francisco 2012). Additionally, certain avian species such as house finch (*Carpodacus mexicanus*), black phoebe (*Sayornis nigricans*), and barn swallow (*Hirundo rustica*) may find built structures such as buildings, bridges, and shipping containers attractive as nesting habitat.

Several of the project component sites are located close to stands of mature street trees. The stands of trees vary in size, but are estimated at approximately 12 to 20 trees each, with the largest stands located along Townsend Street (where the realigned Fourth and Townsend Street Station and related vent structures are proposed), Howard and Main Streets (site of the proposed intercity bus facility), along Stillman Street between Second and Third Streets (adjacent to the proposed AC Transit bus storage facility), and along Beale Street (where an access/exit portal from the BART/Muni underground pedestrian connector is proposed). None of the other proposed project components has mature trees in the immediate vicinity.

Sensitive Natural Communities

Sensitive natural communities are designated by resource agencies, such as the California Department of Fish and Wildlife (CDFW), or in local policies and regulations. This designation generally indicates that the communities have important functions or values for wildlife, and/or are recognized as declining in extent or distribution and are considered threatened enough to warrant protection. For example, many local agencies in California consider protection of oak woodlands important, and federal, state, and most local agencies also consider wetlands and riparian habitat as sensitive communities. The California Natural Diversity Data Base (CNDDB) (administered by CDFW) tracks communities believed to be of conservation concern. These communities are typically considered sensitive for the purposes of CEQA analysis.

Appendix D provides a CNDDB-generated list of special-status species that have been documented from, or have potential to occur in, suitable habitat within San Francisco County (CDFW 2014). The list is

based on results from the San Francisco North U.S. Geological Survey 7.5-minute topographic quadrangle, in which the project area is located. Based on the results of the CNDDB query and previous environmental documents, and an evaluation of the habitat conditions of the project area, all species present on the CNDDB list were eliminated from further evaluation because the project area does not provide suitable habitat for them. Furthermore, no sensitive communities or riparian habitat occurs within the project area (City of San Francisco 2012).

Migratory and Nesting Birds

The City and surrounding Bay waters (also referred to as the San Francisco Bay Estuary) provide habitat for more than 200 species of birds, with some species as year-round residents, other species as winter residents, and others passing through along the Pacific Flyway during spring and fall migration periods (mid-March to early June and late August through late October). In addition, CDFW defines the nesting season as February 1 through August 15.

The San Francisco Bay Estuary is the nation's second largest estuary on the Pacific Coast. Thus, due to the City's proximity within the Pacific Flyway and the sheer number of migratory birds traversing the City every year, San Francisco in 2011 became the first city in the nation to develop quantifiable standards to help protect millions of migratory birds from crashing into untreated plate glass windows on future buildings.

While avian diversity in the City is highest in areas with relatively large, diverse patches of habitat, the City's proximity to San Francisco Bay has created additional opportunities for nesting and migrating birds. The project area is located less than a half mile from San Francisco Bay. As a result, trees, shrubs, and buildings within the proposed project area have the potential to provide nesting habitat for a variety of birds and patches of habitat for potential use by migrants as stop-over sites.

The most common species documented as nesting in the general downtown area are Brewer's blackbird (*Euphagus cyanocephalus*), American robin (*Turdus migratorius*), mourning dove (*Zenaida macroura*), rock dove, house finch, house sparrow, European starling, and brown-headed cowbird (*Molothrus ater*). Less-frequently-found nesters include Anna's hummingbird (*Calypte anna*), common bushtit (*Psaltriparus minimus*), white-crowned sparrow (*Zonotrichia leucophrys*), chestnut backed chickadee (*Poecile rufescens*), and hooded oriole (*Icterus cucullatus*). As discussed below under "Regulatory Framework," most migratory and nesting birds are protected from harm by the federal Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code (City of San Francisco 2012).

Jurisdictional Waters and Wetlands

As described above, the proposed project area is fully developed and contains no waterways, lakes, or other impoundments of water. No potentially jurisdictional waters or wetlands occur within the proposed project area (City of San Francisco 2012).

Because all construction would occur outside the Bay Conservation and Development Commission's 100-foot "shoreline band," and because no wetlands or bay waters would be affected by the proposed project, no effects on the San Francisco Bay or its species would occur (FTA 2004).

Biological Resources at the Proposed Project Component Sites

Biological features and resources in the vicinity of each proposed project component are described below.

- ***Widened throat structure.*** All features of this project component would be located underground. No biological resources are present.

- ***Extended train box.*** All features of this project component would be located underground. No biological resources are present.

- ***Realigned Fourth and Townsend Street Station.*** All features of this proposed project component would be located underground, except for the vent structures (see below). No biological resources are present.

- ***Vent structures.*** Six vent structures would be constructed and extend above the surface level. Proposed locations of the vent structures are in highly developed areas dominated by concrete, pavement, and landscaping. The vent structure area at Natoma and Main Streets, unlike the other sites, includes a number of tall, mature trees extending from Howard Street north to Mission Street. Mature trees are also present at the proposed vent structures at the realigned Fourth and Townsend Street Station.

- ***Tunnel stub box.*** This is a short tunnel segment that would be constructed beneath the U-wall within the Caltrain railyard. All features of this proposed project component would be located underground, and no biological resources are present.

- ***Rock dowels.*** This component would be located underground and would be installed during tunnel construction. No biological resources are present.

- ***Additional trackwork south of the Caltrain railyard.*** This component would be located at-grade within Caltrain's existing right-of-way along Seventh Street, which currently is used for Caltrain operations. No biological resources are present in or along the right-of-way where this project component is proposed.

- ***Intercity bus facility.*** This project component would be located at the easternmost end of the Transit Center, between Beale and Main Streets. The area is composed of large office buildings and a parking lot. Prominent biological resources are limited to the mature street trees located within the parking lot area and adjacent to Main and Howard Streets.

- ***Taxi staging area.*** This project component would be located at street level at curbside along Minna, Natoma, and Beale Streets. No biological resources are present in these paved areas except for an occasional street tree.

- ***Bicycle/controlled vehicle ramp.*** This project component would start at street level at Howard Street and descend below-grade into the Lower Concourse of the Transit Center. The area is densely developed with large and small buildings. No significant biological resources occur in this area.

- ***AC Transit bus storage facility parking***. This proposed facility is currently used as a daily commuter parking area. The site is all paved and located underneath and immediately adjacent to Interstate 80. Biological resources in the area are limited to mature landscape trees that line both

the north and south sides of Stillman Street from Second to Third Streets. These trees are the only prominent biological resources in the area.

- ***BART/Muni underground pedestrian connector.*** Features of this project component would be predominantly underground, except for a possible access/exit between the northern and southern ends of the connector. Mature street trees and ornamental landscaping associated with the commercial businesses along Beale Street are the only biological resources in the area.

- ***Adjacent land development.*** Adjacent land development opportunities are located at the sites of the vent structure at Third and Townsend Streets (i.e., the preferred southeast corner and the alternate location at the northeast corner) and the intercity bus facility. Accordingly, the biological resources at these sites are identical to the biological setting for the transportation facilities with which they would be co-located. Refer to the vent structure and intercity bus facility descriptions above for the biological resources at the proposed adjacent land development sites.

Regulatory Framework

The following discussion summarizes the relevant laws, regulations, and policies concerning biological resources, preservation, and management, including new guidance issued since the 2004 FEIS/EIR.

Federal

Federal Endangered Species Act (16 USC 1531–1544)

The Federal Endangered Species Act (FESA) provides protection for federally listed special-status species, and requires conservation of the critical habitat for those species. An "endangered" species is a species in danger of extinction throughout all or a significant portion of its range. A "threatened" species is one that is likely to become "endangered" in the foreseeable future without further protection. Other federally listed special-status species include "proposed" and "candidate" species. Proposed species are those that have been officially proposed (in the Federal Register) for listing as threatened or endangered. Candidate species are those for which enough information is on file to propose listing as endangered or threatened. A "delisted" species is one whose population has reached its recovery goal and is no longer in jeopardy.

Areas of habitat considered essential to the conservation of an endangered or threatened species may be designated as critical habitat, which is protected under the FESA. Critical habitat designations are intended as a tool to be used by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in helping federal agencies comply with their obligations under Section 7 of the FESA.

In general, the NMFS is responsible for protection of FESA-listed marine species and anadromous fish, which are not relevant to the proposed project. Other species are under USFWS jurisdiction. FESA Section 9 prohibits the "take" of federally listed special-status species. FESA Section 7 requires formal consultation with the USFWS for projects that may affect those species that are either listed as or proposed for listing as endangered or threatened to ensure that the proposed project will not jeopardize federally listed special-status species or destroy or adversely modify designated critical habitat. The Section 7 consultation process provides a means of authorizing the "take" of federally listed special-status species. Taking is defined by FESA (Section 3[19]) to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."

Federal Migratory Bird Treaty Act (16 USC 703-712)

The federal Migratory Bird Treaty Act (MBTA) established special protection for migratory birds by regulating hunting or trade in migratory birds. Furthermore, this act prohibits anyone to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Definition of "take" includes any disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young), and such activity is potentially punishable by fines and/or imprisonment. In 2004, the Migratory Bird Treaty Reform Act amended the MBTA to state that it only applies to migratory bird species that are native to the United States or its territories, and that a native migratory bird is one that is present as a result of natural biological or ecological processes. The federal MBTA is relevant to this project because the San Francisco Bay Area (including the project area) is located within the Oceanic Route of the Pacific Flyway. As a result, nesting migratory birds could be encountered during the migratory and nesting seasons.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on biological resources, and to avoid or mitigate those impacts when feasible. Pursuant to CEQA Guidelines Section 15380, potential impacts on biological resources need to be assessed.

California Endangered Species Act

Similar to the FESA, the California Endangered Species Act (CESA) (along with the Native Plant Protection Act) authorizes the California Fish and Game Commission to designate, protect, and regulate the taking of special-status species in California. The CESA defines "endangered" species as those whose continued existence in California is jeopardized. State-listed "threatened" species are those not presently threatened with extinction but that may become endangered if their environments change or deteriorate. Any proposed projects that may adversely impact state-listed threatened or endangered species must formally consult with the CDFW. Section 2080 of the California Fish and Game Code prohibits the taking of state-listed plants and animals.

The CDFW also designates "fully protected" or "protected" species as those that may not be taken or possessed. Species designated as fully protected or protected may or may not be listed as endangered or threatened.

California Fish and Game Code

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.3 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. California Fish and Game Code Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) allow the designation of a species as "fully protected." This is a greater level of protection than is afforded by the CESA, since such a designation means the listed species cannot be taken at any time, except, under certain circumstances, in association with a species recovery plan. The California Fish and Game Code is relevant to the proposed project because the San Francisco Bay area (including the project area) is located within the Oceanic Route of the Pacific Flyway. As a result, nesting migratory birds could be encountered during the migratory and nesting seasons.

Local

San Francisco's Urban Forestry Ordinance

The City's Urban Forestry Ordinance (Article 16 of the Public Works Code) protects San Francisco's street trees, significant trees, and landmark trees regardless of species. The three categories of trees protected by the ordinance are defined as follows:

- 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 the Department [of Public Works]" as defined in Section 802 of the Urban Forestry Ordinance. The removal of street trees by persons other than the Department of Public Works is restricted by Section 806b, whereby a permit is required for removal.

- Significant trees are defined in Section 810A of the Urban Forestry Ordinance as trees (1) on property under the jurisdiction of the Department of Public Works or on privately owned property with any portion of its trunk within 10 feet of the public right-of-way, and (2) that satisfies at least one of the following criteria: (a) diameter at breast height in excess of 12 inches, (b) height in excess of 20 feet, or (c) canopy in excess of 15 feet. The removal of significant trees by persons other than the Department of Public Works requires a permit from the Department of Public Works according to the process described in Section 806b of the Urban Forestry Ordinance.

- Landmark trees are trees that have been nominated as landmark trees by a member of the public, the landowner, the Planning Commission, the Board of Supervisors, or the Historic Preservation Commission, and that have been subsequently recommended as a landmark tree by the Urban Forestry Council (within the Department of the Environment), and then must be designated a landmark tree by ordinance approved by the Board of Supervisors. Trees that have been nominated and are undergoing review are protected according to the same standards as designated landmark trees while going through the review process, according to Section 810 of the of the Urban Forestry Ordinance. No landmark trees occur in the project area (City of San Francisco 2014).

San Francisco's Bird-Safe Building Ordinance, Planning Code Section 139

This building ordinance establishes standards for bird-safe buildings, both public and private, to help reduce injury and mortality in birds caused by certain types of new construction, replacement facades, and building features. General findings associated with the Standards for Bird-Safe Buildings includes documented risks that structures present to birds. More than 30 years of research have proven the risks to be "biologically significant" for certain bird species, with recent studies determining that annual bird fatalities in North America from window collisions may be as high as 1 billion birds per year, or 1 to 5 percent of all birds. Building collisions are considered a threat of significant magnitude to the viability of bird populations, leading to local, regional, and national declines. The findings also reported that San Francisco has almost 400 different bird species located along the Pacific Flyway, and has numerous open spaces.

The Bird-Safe Building Ordinance outlines ways to minimize bird strikes on buildings that have location-specific hazards and feature-related hazards. Location-specific hazards apply to buildings in or within 300 feet of and having a direct line of sight to an Urban Bird Refuge. Such a refuge includes "open spaces two acres and larger dominated by vegetation, including vegetated landscaping, forest, meadows, grassland, or wetlands, or open water." Two Urban Bird Refuge areas occur near the project area: Yerba Buena

Gardens (between Mission and Howard Streets and Third and Fourth Streets) and the area along Mission Creek between Fourth and Seventh Streets (City and County of San Francisco 2012).

Feature-related hazards may create increased risks to birds regardless of where the structure is located. The ordinance requires that 90 percent of glazing in the "Bird Collision Zone" (i.e., 60 feet above-grade, plus 60 feet above an adjacent vegetated roof 2 acres or larger) be treated (i.e., fritted, stenciled, frosted, or covered with netting, screens, grids, or bird-visible UV patterns). Lighting also must be minimized, and any wind generators must comply with City Planning Department requirements, "including any monitoring of wildlife impacts that the [Planning] Department may require" (City of San Francisco 2011).

3.7.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

Because the previous environmental document determined that no significant biological resources were present in the project area, the purpose of this SEIS/EIR is to determine if the presence of biological resources, or the lack thereof, has changed since the approval of the 2004 FEIS/EIR. The analysis evaluates the new features of the proposed project to determine if biological impacts would occur in the project area. The proposed project would have a potentially significant impact related to biological resources if it were to do any of the following:

- 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 CDFW, USFWS, or NMFS;
- 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 CDFW or USFWS;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including marsh, vernal pool, coastal);
- 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;
- conflict with any applicable local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan; or
- substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, or substantially reduce the number or restrict the range of an endangered, rare, or threatened species (CEQA Guidelines Sections 15065[a][1] and [c]).

Issues Not Addressed Further in this SEIS/EIR

The 2004 FEIS/EIR stated that no adverse effects on endangered species of wildlife or plants or their habitats would occur, and no wetlands were present (FTA 2004), and that discussion is incorporated by reference in this SEIS/EIR. As stated in Section 3.7.2, Affected Environment, above, the project area does

not contain listed species covered by the CESA or FESA (other than migratory birds) or relevant habitat conservation plans, or contain wetlands, riparian habitat, or other sensitive natural communities. Therefore, the environmental setting with respect to sensitive biological species or habitats has not changed since the 2004 FEIS/EIR. Accordingly, these biological resources are not discussed below under "Environmental Analysis."

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the components of the proposed project described in this SEIS/EIR would not be implemented, biological effects will be the same as those presented in Section 4.9 Vegetation and Wildlife (page 4-39) of the 2004 FEIS/EIR and the subsequent addenda. The 2004 FEIS/EIR and addenda indicated that the Transbay Program will have no effect/no impact on vegetation or wildlife because no species or habitat considered endangered, threatened, rare, or otherwise sensitive are present in the project area.

Proposed Project

Because the proposed project consists of Phase 2 refinements and other transportation improvements and adjacent land development at or adjacent to elements of Phase 2 of the Transbay Program, the 2004 FEIS/EIR addresses the biological resources impacts that are directly relevant to the proposed project. The assessment below is, therefore, substantially similar to the one in the 2004 FEIS/EIR, although current information for migratory and nesting birds has been added. As stated previously, all mitigation measures contained in the 2004 FEIS/EIR were adopted and are part of the definition of the proposed project. Since there were no biological mitigation measures required in the 2004 FEIS/EIR, no measures have been incorporated into the proposed project. However, a mitigation measure has been added to this SEIS/EIR, as described in detail below.

Impact C-BR-1: The proposed project has the potential to disturb nesting birds when buildings/ structures with potential nesting habitat would be disturbed as part of an individual project component and/or during removal of trees and shrubs during project construction, but this potential effect would be avoided by proposed preconstruction mitigation. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The proposed project construction activities have the potential to affect migratory and nesting birds at several locations within the project area, including the vent structure at the realigned Fourth and Townsend Street Station, the intercity bus facility, AC Transit bus storage facility parking, BART/Muni underground pedestrian connector. These areas are generally at Main and Howard Streets, along Townsend Street, in the vicinity of Second and Stillman Streets, and along Beale Street, respectively. As shown in Figure 3.7-1 through Figure 3.7-4, these areas contain a number of mature trees that could serve as nesting habitat during the nesting and migratory bird seasons. In addition, temporary or permanent buildings and structures associated with the proposed project may be attractive as nesting habitat to certain migratory bird species, including those described below under "Affected Environment." No nests were observed during a preliminary site visit conducted in March 2014.

Disruption of nesting birds is not permitted under the federal MBTA or the California Fish and Game Code. The loss of any active nest (i.e., removing a tree or shrub or demolishing a building containing a nest) must be avoided under federal and state laws. The loss of an active nest would be considered a significant impact under CEQA if that nest were occupied by a special-status bird species.

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-1a View of Mature Trees near the Proposed Intercity Bus Facility (along northwest side of Howard and Main Streets, facing north)

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-1b: View of Mature Trees near the Proposed Intercity Bus Facility (along west side of Main Street between Howard and Mission Streets, facing northwest)

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-2a View of Landscape Trees near Proposed Vent Structure at Fourth and Townsend Streets (at Townsend and Fourth Streets, facing west from Fourth Street)

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-2b View of Mature Trees near Proposed Vent Structure at Fifth and Townsend Streets (along Townsend Street, facing east from Sixth Street)

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-3a View of Mature Trees near Proposed Alameda–Contra Costa Transit Bus Storage Facility Parking (along Stillman Street, facing west from Second Street)

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-3b View of Mature Trees near Proposed Alameda–Contra Costa Transit Bus Storage Facility Parking (along Stillman Street, facing northwest from Second Street)

Source: Photo taken by BioMaAS staff in 2014

Figure 3.7-4 View of Mature Trees near Possible Access/Exit for the Proposed Underground Pedestrian Connector (along the west side of Beale Street, facing southwest)

Mitigation Measure. The proposed project analyzed in this SEIS/EIR could result in an adverse effect/ potentially significant impact that was not specifically addressed in the 2004 FEIS/EIR. Implementation of New-MM-C-BR-1.1 would reduce the possible adverse NEPA effect to a no adverse effect and also would reduce the potentially significant CEQA impact to a less-than-significant level.

New-MM-C-BR-1.1 *Require Pre-Construction Bird Surveys.* Pre-construction bird surveys shall be required when trees or buildings and/or structures with potential nesting habitat would be disturbed as part of an individual project component. Pre-construction bird surveys shall be conducted on affected potential nesting habitat by a qualified biologist during the nesting season (February 1 through August 15) if construction activities are scheduled to take place during that period. Surveys shall be performed not more than 2 weeks prior to construction in an affected area. If special-status bird or migratory bird species are not found, work may proceed and no further mitigation action is required.

If, special-status bird or migratory bird species are found to be nesting in or near any work area (at a distance to be determined by qualified biologist) or, for compliance with federal and state law concerning migratory birds, if birds protected under the federal MBTA or the California Fish and Game Code are found to be nesting in or near any work area, an appropriate no-work buffer zone (e.g., 100 feet for songbirds, 250 feet for raptors) shall be designated by the biologist. Depending on the species involved, the qualified biologist may require input from the CDFW and/or USFWS Division of Migratory Bird

Management regarding the most appropriate ways to avoid disturbance to nesting birds. As recommended by the biologist, no activities shall be conducted within the no-work buffer zone that could harass birds, or disrupt bird nesting or cause nest abandonment. Outside of the nesting season (August 16 through January 31), or after young birds have fledged, as determined by the biologist, work activities may proceed. Birds that establish nests during the construction period are considered habituated to such activity, and no buffer shall be required, except as needed to avoid direct destruction of the nest, which shall be prohibited.

Cumulative Analysis

Impact CU-BR-2: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on biological resources. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The proposed project area is located within the Oceanic Route of the Pacific Flyway (City of San Francisco 2011). The geographic extent of this analysis is defined as the area within the Transbay Program, Transit Center District Plan, and Central SoMa Plan, since the biological effects related to the proposed project are localized and development in this area has the potential to affect similar biological resources. Past projects, including extensive development of public infrastructure, residences, and commercial and industrial areas, have already caused substantial adverse cumulative changes to biological resources in and around the project area. As a result, there are no natural communities, wetlands, riparian areas, or other sensitive habitat anticipated to be affected by cumulative projects. Therefore, the cumulative projects, in combination with the proposed project, would have no cumulative impact on biological resources other than during the construction period when nesting birds or their eggs could be affected. As stated previously, CDFW defines the nesting season as February 1 through August 15. The proposed project would require the removal of mature trees at several of the proposed project component sites. Cumulative effects could occur if construction associated with the proposed project were in proximity to that of other foreseeable development (within 250 feet) and construction schedules overlapped during the peak migration periods (mid-March to early June and late August through late October). Table 3.1-1 identifies other development projects that are foreseeable within 0.5 mile of the proposed project. Those specific development projects within 250 feet of the proposed project, as well as development that is anticipated to occur in accordance with the Transbay Program and the Transit Center District Plan, in combination with the proposed project, could have a significant cumulative effect on nesting birds or their eggs.

Implementation of New-MM-C-BR-1.1 would reduce the proposed project's impact on migratory and nesting birds to a less-than-significant level. Cumulative projects that involve the removal of mature trees would be required to comply with local laws, the California Fish and Game Code, and the MBTA, as well as all applicable permitting requirements of the regulatory and oversight agencies regarding migratory birds, and project-specific mitigation measures. Therefore, cumulative impacts on nesting birds would be not adverse under NEPA and less than significant under CEQA.

3.7.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Biological Resources (Not Adverse with Mitigation)	The 2004 FEIS/EIR did not identify effects on biological resources or specifically address migratory and nesting birds. The proposed project analyzed in this SEIS/EIR could result in an effect not identified in the 2004 FEIS/EIR related to migratory and nesting birds. Therefore, the proposed project may change the effects identified in the 2004 FEIS/EIR. With implementation of New-MM-C-BR-1.1, this possible adverse effect would be reduced. Compliance with the MBTA and the California Fish and Game Code that is required of all projects, plus implementation of the new mitigation measure, would reduce project-related and cumulative effects to not adverse.
CEQA Summary	
Impact C-BR-1: Construction – Nesting Birds (Less than Significant with Mitigation)	The 2004 FEIS/EIR did not identify impacts on biological resources. The proposed project analyzed in this SEIS/EIR could result in a new significant impact related to migratory and nesting birds. Therefore, the proposed project could change the significance conclusion in the 2004 FEIS/EIR because migratory and nesting birds were not specifically addressed. With implementation of New-MM-C-BR-1.1, the impact of the proposed project would be reduced to a less-than-significant level.
Impact CU-BR-2: Cumulative – Biological Resources (Less than Significant with Mitigation)	The 2004 FEIS/EIR did not identify effects on migratory and nesting birds. With implementation of New-MM-C-BR-1.1 and compliance with the MBTA and the California Fish and Game Code required of all projects, the cumulative impacts would be less than significant.

3.8 WATER RESOURCES AND WATER QUALITY

3.8.1 Introduction

This section identifies the water resource and water quality setting in the vicinity of the proposed project components. Both surface water and groundwater conditions are presented. Issues addressed in this section include the potential of the proposed project to affect flood hazard risks, below-ground construction that may affect groundwater, and changes to stormwater runoff and quality. In particular, the analysis focuses on the proposed project component locations and whether water resources or flood hazards are present and/or if conditions have changed since approval of the 2004 FEIS/EIR (FTA 2004).

3.8.2 Affected Environment

Flood Hazards

FEMA Special Flood Hazard Areas and Flood Insurance Rate Maps

Flood hazard areas—those areas susceptible to flooding—are mapped by the Federal Emergency Management Agency (FEMA). FEMA maps do not take into account future conditions or reflect sea-level rise. High risk or "special" flood areas are those that would be flooded by a storm that occurs, on average, once every 100 years. To protect such areas from flood hazards, FEMA administers the National Flood Insurance Program (NFIP). The NFIP is a federal program created to avert future flood losses through building and zoning ordinances and to provide federally backed flood insurance protection for property owners. Participation in the NFIP is based on an agreement between local communities and the federal government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community. In April 2010, FEMA approved San Francisco's application for participation in FEMA's NFIP.

Most flood hazard areas are commonly identified on Flood Insurance Rate Maps (FIRMs). The FIRMs delineate different SFHA zones. SFHAs associated with the 1 percent probability of annual exceedance are zones that begin with the letter "A" (e.g., Zone A, Zone AE, and Zone AO). SFHA Zone A is an area that is subject to inundation by the 1 percent annual chance flood event (also referred to as the 100-year flood) that has been determined by approximate methods; no base flood elevations or flood depths are shown. Zone V also represents areas that are subject to inundation by the 1 percent annual chance flood event, with additional hazards associated with storm-induced waves in areas of coastal flooding. Zones beginning with other letters are associated with higher-intensity events that have smaller probabilities of occurring in a particular year.

Flood Hazards in the Project Area

The 2004 FEIS/EIR reported that the City did not participate in the FEMA NFIP, and that no floodplains were identified within San Francisco. However, FEMA issued preliminary FIRMs for the City in 2007. In July 2008, the City prepared interim floodplain maps. In 2010, the City enacted the Floodplain Management Ordinance that regulates construction and governs improvements to structures in flood-prone areas. These preliminary FIRMs and interim floodplain maps were based on a limited study of coastal flooding only. FEMA has been conducting a more detailed analysis of flood hazards associated with San Francisco Bay, and a revised preliminary map was provided to the City in 2013 (FEMA 2013). These maps are still not finalized. After the revised preliminary FIRM is completed, FEMA will publish a final FIRM that will be used for floodplain management and flood insurance purposes.

Because no final FEMA FIRM exists for San Francisco at this time, the most recent preliminary FEMA FIRM (2013), which used more up-to-date data and detailed analysis than was used in the development of the 2007 preliminary FEMA FIRM, is presented here. Although not finalized, the 2013 preliminary FEMA FIRM has been used in other recent environmental documents in San Francisco, including the University of California, San Francisco 2014 Long Range Development Plan Environmental Impact Report (November 2014). For completeness, the location of the proposed project according to the 2007 preliminary FEMA FIRM and 2008 San Francisco interim floodplain maps also are presented.

- Preliminary FIRMs prepared by FEMA in 2007 show a portion of the tunnel stub box near Sixth Street, a portion of the realigned Fourth and Townsend Street Station, and the vent structure at the western end of the Fourth and Townsend Street Station within a SFHA Zone A 100-year floodplain (FEMA 2007).

- The 2008 San Francisco interim floodplain map shows the same project components within the SFHA (San Francisco Office of the City Administrator 2008).

- The most recent preliminary FEMA FIRM (2013) shows none of the proposed project components within the 100-year floodplain; however, the eastern edge of the extended train box, vent shaft and emergency exit, intercity bus facility, and taxi staging area are within the 500-year flood zone. The 500-year flood zone encompasses areas subject to a 0.2-percent-annual-chance flood event. The locations of the proposed project components in relationship to mapped flood hazard areas, as identified in the 2013 preliminary FEMA FIRM, are shown in Figure 3.8-1.

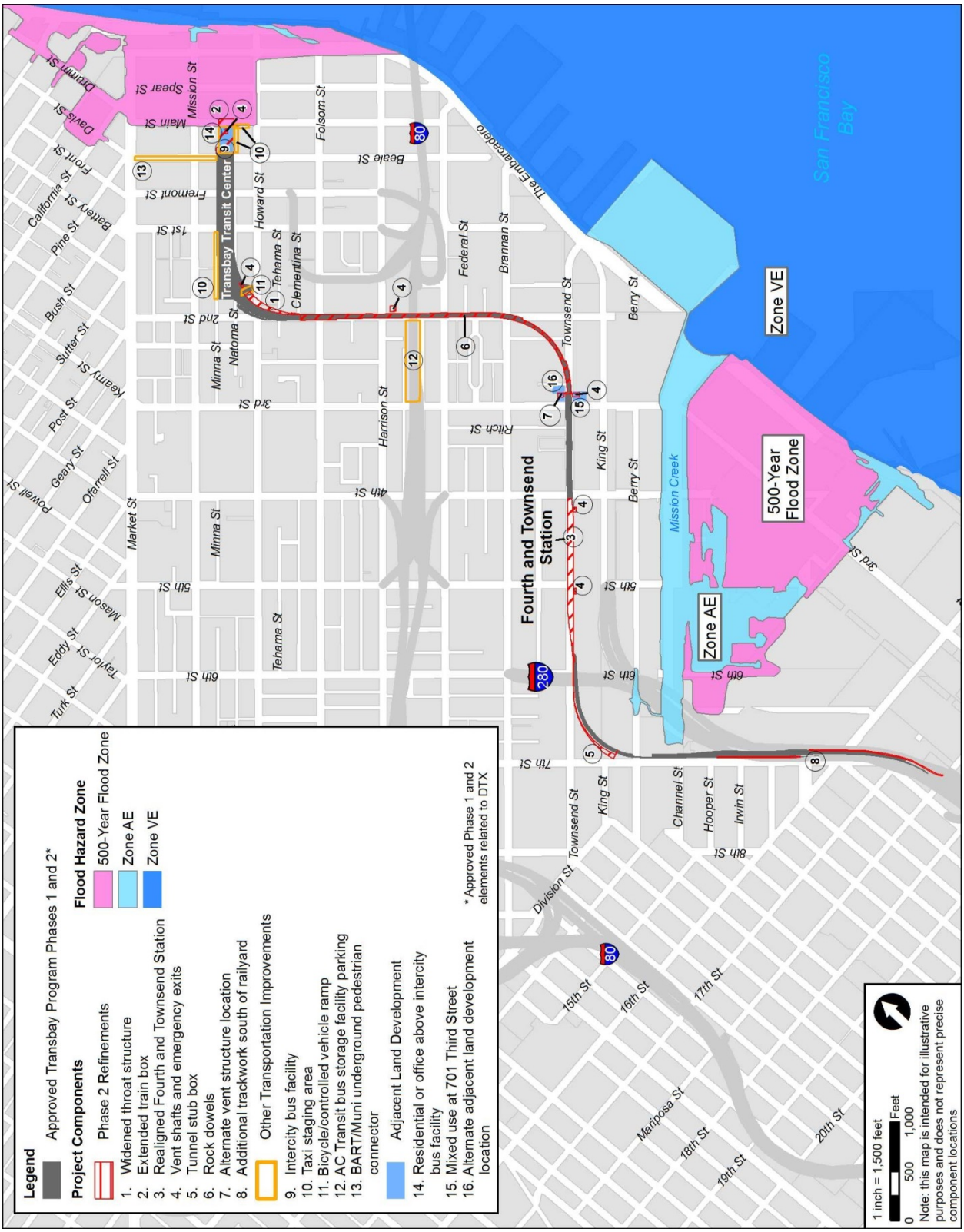
Executive Order (EO) 13690 amending EO 11988 was signed on January 30, 2015, modifying the definition of the floodplain for the purposes of FEMA floodplain management. As described later in this section under the Regulatory Framework, EO 13690 describes several alternative approaches for determining whether a proposed action will be located in a floodplain. EO 13690 states that the floodplain shall be established based on climate-informed science, the 100-year floodplain with the addition of 2 feet to the base flood elevation for non-critical actions,[1] or the 500-year (0.2 percent annual) floodplain. Regulations and procedures to implement EO 13690 have not been developed yet. Figures 3.8-1 through 3.8-4 show possible flood hazard conditions under the different floodplain definitions identified in EO 13690.

- Figure 3.8-2 shows that the project site from approximately Fourth Street to Irwin Street would be in the floodplain, as defined by the base flood elevation (10 feet) with the addition of 2 feet. The extended train box, vent shaft and emergency exit at the Transit Center, intercity bus facility, and taxi staging area would be partially or completely located in the floodplain defined as the 100-year floodplain base flood elevation plus 2 feet. This area also is mapped in the preliminary 2013 FEMA FIRM as being within the 500-year floodplain (see Figure 3.8-1).

- Figures 3.8-3 and 3.8-4 show flooding hazards that are based on climate-informed science and indicate that the project site would be inundated by up to 6 feet of water by 2100 based on the most conservative, worst-case assumptions for sea-level rise and using a mean higher high water (MHHW) tidal datum.[2] The projections shown in Figures 3.8-3 and 3.8-4 are the upper end of the conservative assumptions for future sea-level rise, meaning that they show the greatest projected depth and areal extent of flooding. The science of projecting sea-level rise may evolve over time as additional data and methods are developed and uncertainties are resolved. A portion of the

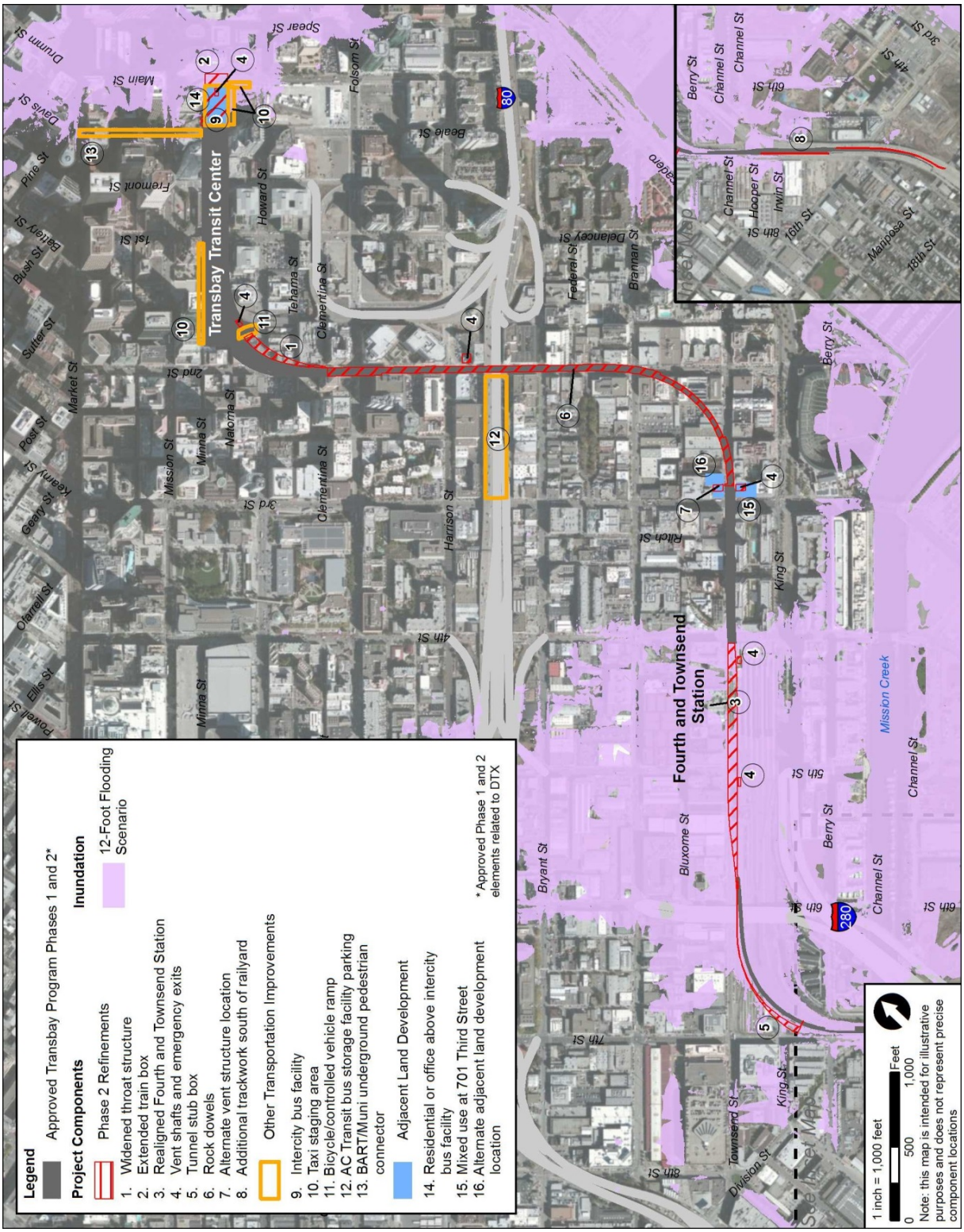
[1] EO 13690 states that for non-critical actions, 2 additional feet must be added to the base flood elevation to determine the pertinent floodplain. For critical actions, 3 additional feet must be added. A "critical action" is defined in the Regulatory Framework.

[2] The MHHW datum is the average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch.



Sources: FEMA 2013; City and County of San Francisco 2013; compiled by AECOM in 2015

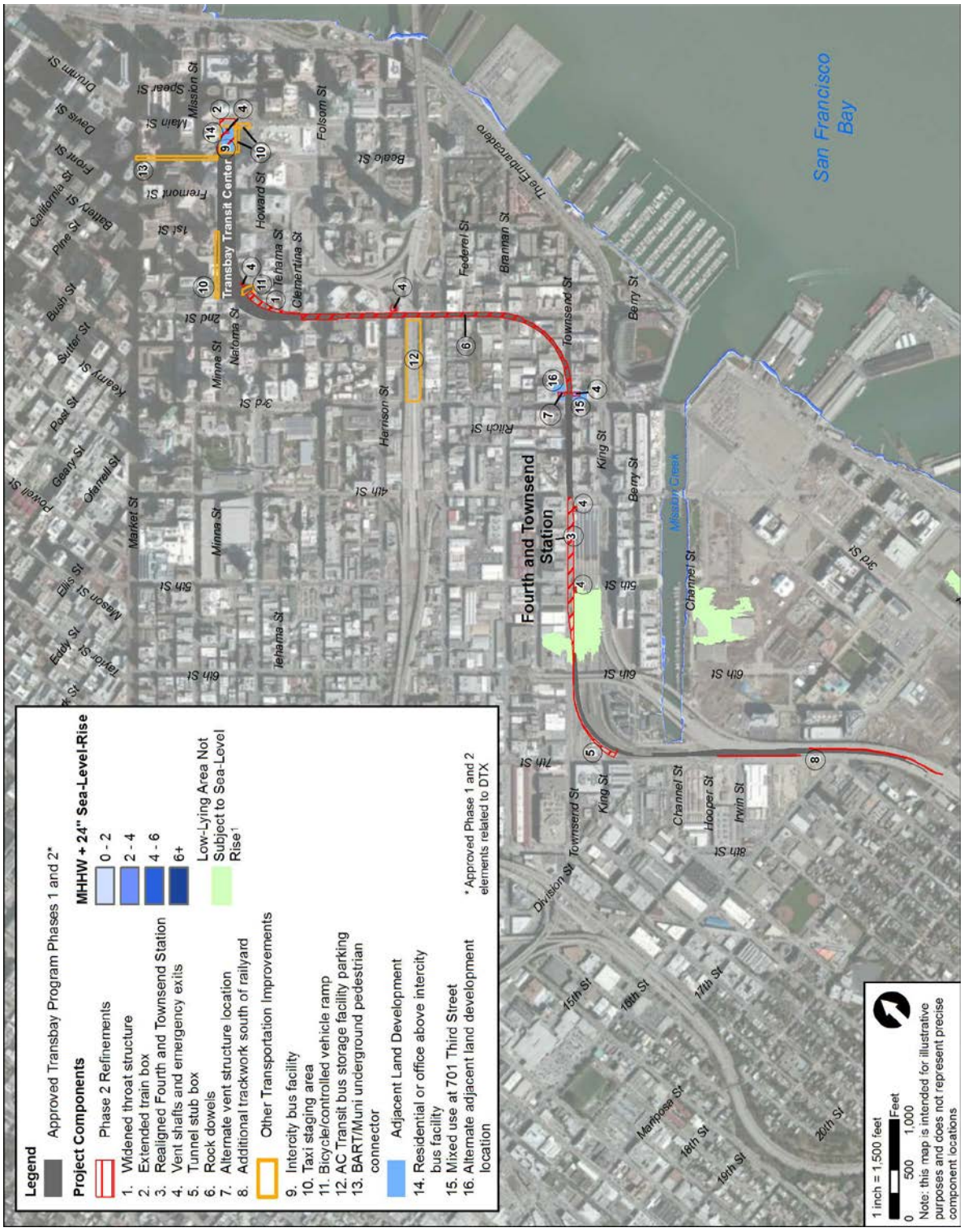
Figure 3.8-1 Preliminary FEMA Flood Hazard Mapping in the Project Area



Sources: FEMA 2013; City and County of San Francisco 2013; adapted by AECOM in 2015

Note: The 12-foot flooding area by Mission Bay does not take into account connectivity to Mission Creek; it shows all areas with an elevation of 12 feet (10-foot base flood elevation + 2 additional feet) or less.

Figure 3.8-2 Flood Hazard Mapping in the Project Area for the 100-Year Flood Base Flood Elevation (10 feet) plus 2 feet (12-Foot Flooding Scenario)

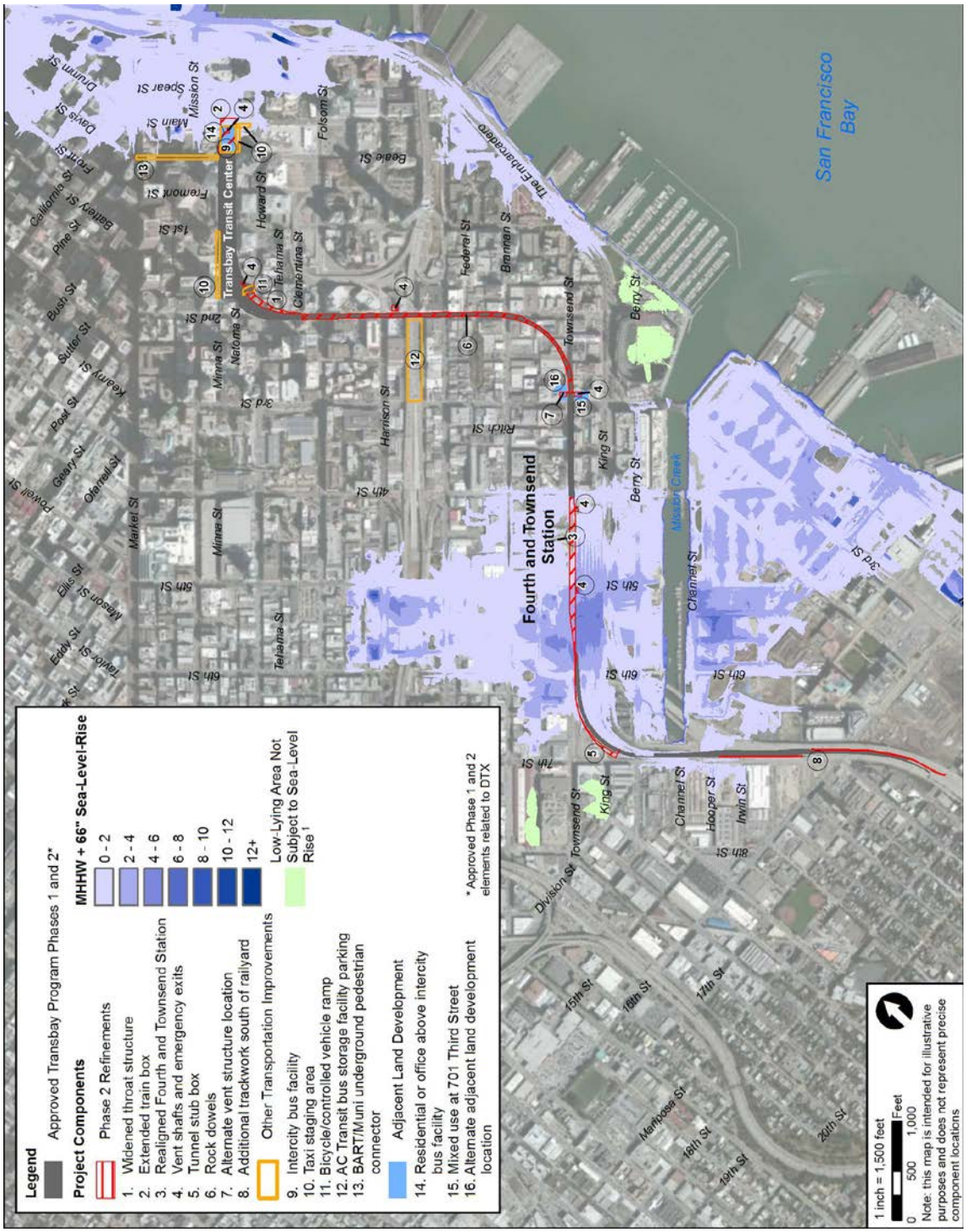


Sources: SFPUC 2014; City and County of San Francisco 2013; The sea-level rise inundation mapping and supporting technical information were developed by AECOM for the San Francisco Public Utilities Commission's Wastewater Enterprise as part of its Sewer System Improvement Program. SFPUC provided the mapping to TJPA for use in this SEIS/EIR.

Notes:

[1] Low-lying areas identified in Figure 3.8-3 are hydrologically disconnected from flooding from Mission Creek or San Francisco Bay in this 2050 scenario and therefore would not be subject to flooding due to sea-level rise from these sources.

Figure 3.8-3 Areas Vulnerable to Inundation by Sea-Level Rise in 2050



Sources: SFPUC 2014; City and County of San Francisco 2013; The sea-level rise inundation mapping and supporting technical information were developed by AECOM for the San Francisco Public Utilities Commission's Wastewater Enterprise as part of its Sewer System Improvement Program. SFPUC provided the mapping to TJPA for use in this SEIS/EIR.

Notes:

[1] Low-lying areas identified in Figure 3.8-4 are hydrologically disconnected from flooding from Mission Creek or San Francisco Bay in this 2100 scenario and therefore would not be subject to flooding due to sea-level rise from these sources.

Figure 3.8-4 Areas Vulnerable to Inundation by Sea-Level Rise in 2100

Caltrain railyard is within a low-lying area as mapped in the 2050 scenario (Figure 3.8-3), but this area is not identified as an area vulnerable to sea-level rise in 2050 because it is hydrologically disconnected from the Mission Creek Channel and San Francisco Bay.

In summary, the proposed project area could be inundated, depending on the flood scenario, as described below.

- 2013 Preliminary FEMA FIRM 100-year floodplain – no
- 2013 Preliminary FEMA FIRM base flood elevations + 2 feet – yes
- 2013 Preliminary FEMA FIRM 500-year floodplain – yes
- Climate-informed scientific sea-level rise map for year 2050 – no
- Climate-informed scientific sea-level rise map for year 2100 – yes

Sea-Level Rise

Carbon dioxide (CO_2) accounts for more than 75 percent of all anthropogenic greenhouse gas (GHG) emissions, and the global atmospheric concentrations of CO_2 continue to increase. Substantially higher temperatures, more extreme wildfires, and rising sea levels are some of the effects associated with the warming impacts of CO_2 in California (CNRA 2009; CEC 2012). Global climate change has the potential to result in sea-level rise (resulting in flooding of low-lying areas), to affect rainfall and snowfall (leading to changes in water supply), to affect temperatures and habitats (affecting biological resources and public health), and to result in many other adverse environmental consequences. Records from satellite altimeters, tide gauges, and ocean temperature measurements infer a long-term increase in sea level along the Pacific Coast. On average, the coast of California is estimated to have experienced 8 inches (20 centimeters) of sea-level rise over the past century, which is comparable to the global average (CCC 2013).

The water surface elevation of San Francisco Bay potentially may be affected by future sea-level rise. This summary draws on the best available data for climate science and the potential effects of sea-level rise in California as of August 2014. In March 2013, the Ocean Protection Council adopted the 2012 National Research Council's (NRC) report, Sea-level Rise for the Coasts of California, Oregon, and Washington: Past Present and Future, as the best available science on sea-level rise for the state (OPC 2013). The California Coastal Commission also supported the use of the NRC 2012 report as best available current science, finding that the science of sea-level rise is continually advancing, and future research may enhance the scientific understanding of how the climate is changing, resulting in updating sea-level rise projections (CCC 2013). The NRC report includes discussions of historic sea-level rise observations, three sea-level rise projections for the remainder of this century, and insight into the potential impacts of a rising sea on the California coast.

According to the latest NRC report, the Bay Area is expected to see 11 additional inches (a range of 5 to 24 inches) of sea-level rise by 2050, and approximately 36 inches (a range of 17 to 66 inches) by 2100 (NRC 2012). The likelihood of sea-level rise to occur by certain timeframes is described as follows (NRC 2012):

- 12 inches of sea-level rise is "most likely" by 2050;
- 24 inches of sea-level rise by 2050 represents the upper uncertainty boundary;
- 36 inches of sea-level rise is "most likely" by 2100;
- 48 inches of sea-level rise by 2100 is within the upper 85 percent confidence interval; and
- 66 inches of sea-level rise by 2100 represents the upper uncertainty boundary.

Maps illustrating sea-level rise predictions are presented in Figures 3.8-3 and 3.8-4. While the NRC report identifies "most likely" sea-level rise predictions, the most conservative forecasts are presented here to

show the maximum possible amount of inundation in the project area. Specifically, Figure 3.8-3 shows the upper uncertainty boundary (i.e., conservative, worst-case scenario) vulnerability to inundation for given amounts of sea-level rise in the proposed project vicinity by 2050. The various shades of blue represent areas that are not vulnerable today but could experience the effects of sea-level rise by 2050 (also shown by depth in feet). The low-lying areas shown in green represent areas that do not have an effective overland flow path to allow water to reach the area, although these areas have topographic elevations below the inundated water surface, which may be an existing or future flood risk within these areas. As noted previously, forecasts also have been made for sea-level rise to 2100. Figure 3.8-4 shows the upper uncertainty boundary that would be vulnerable to inundation from sea-level rise in 2100.

Tsunami Hazard

A potential tsunami that may affect the proposed project could result from off-shore earthquakes within the Bay Area, or from very distant events. The inundation line in Figure 3.8-5 represents the maximum considered tsunami run-up from a number of extreme, yet realistic, tsunamis. The proposed project area is not susceptible to potential tsunami inundation.

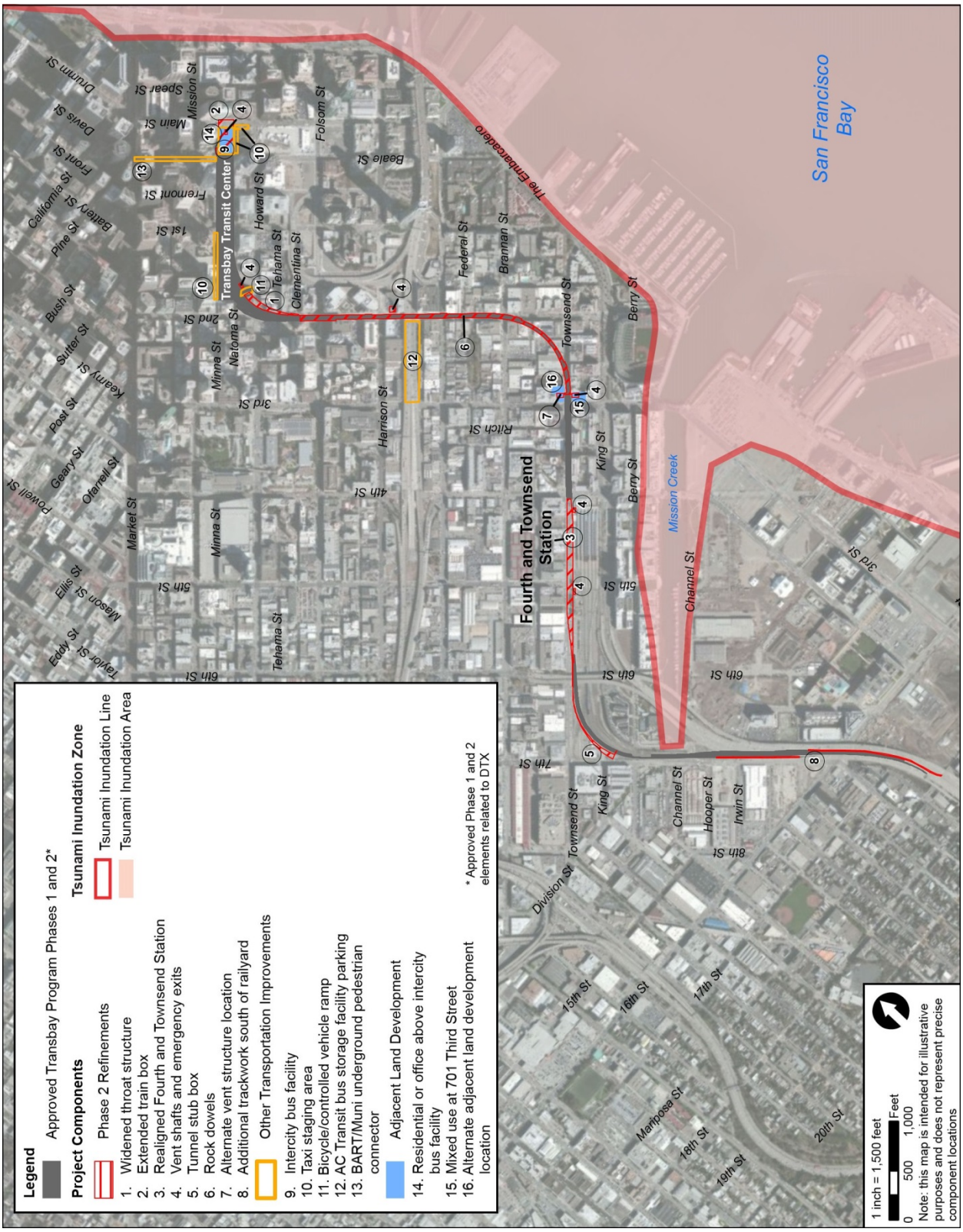
Water Resources and Water Quality

Groundwater

Downtown San Francisco Groundwater Basin. The project area is within the Downtown San Francisco Groundwater Basin (Basin Number 2-40). The Downtown San Francisco Groundwater Basin encompasses 12 square miles and is one of five basins in the eastern portion of the City. The groundwater gradient, or direction of groundwater flow, is toward the northeast. Recharge of this basin is primarily from infiltration of rainfall, landscape irrigation, and leakage from water and sewer lines (DWR 2004). Groundwater from the Downtown San Francisco Groundwater Basin is not used as a water supply in San Francisco.

As described in Section 3.9, Geology, Soils, and Seismicity, of this SEIS/EIR, the historically highest groundwater ranges from 0 feet to 30 feet below ground surface (bgs) for the project area. In general, groundwater is less than 10 feet bgs south of the existing Caltrain Fourth and King Station; north of this Caltrain terminus station, depths to groundwater have been encountered at less than 20 feet bgs in fill, marsh deposits, and Colma Sand (Parsons Transportation Group 2010). The groundwater level is anticipated to vary with the passage of time due to seasonal groundwater fluctuation, surface and subsurface flows into the San Francisco Bay, ground surface runoff, and global warming, which may cause water levels to rise 16 inches over the next 40 years.

Groundwater Quality. The San Francisco Bay Regional Water Quality Control Board's (RWQCB) Basin Plan (2013) identifies "beneficial uses" for groundwater and surface water resources, and sets water quality objectives to ensure the protection of those uses. The Downtown San Francisco Groundwater Basin's existing beneficial uses are municipal and domestic water supply, agricultural water supply, industrial process water supply, and industrial service water supply. The San Francisco Bay RWQCB Basin Plan specifically identifies general water quality objectives for bacteria, organic and non-organic chemical constituents, taste and odor, and radioactivity for all groundwater in the area. Further, the Basin Plan states that groundwater must be free of organic and inorganic chemical constituents in concentrations that adversely affect beneficial uses; groundwater must not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses; and radionuclides must not be present in concentrations deleterious to humans, plants, animals, or aquatic life. Because the Downtown San Francisco Groundwater Basin is designated for municipal, domestic, and agricultural beneficial uses, additional narrative and numeric groundwater objectives for bacteria, organic and inorganic constituents, radioactivity, taste and odor, and organic and inorganic chemical constituents apply.



Sources: City of San Francisco 2012; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.8-5 Tsunami Inundation Areas in the Project Vicinity

Within the proposed project area, groundwater within the fill soils is susceptible to contamination from past industrial land use, placement of contaminated fill material, and releases from underground storage tanks. Brackish conditions exist in most of the proposed project area due to its proximity to San Francisco Bay, and historical land uses contribute varying concentrations of petroleum hydrocarbon contaminants (see Section 3.10, Hazardous Materials, for additional details regarding groundwater contamination and hazardous materials conditions). Groundwater within the Downtown San Francisco Groundwater Basin is also subject to high concentrations of nitrates, and elevated chloride, boron, and total dissolved solids concentrations. High nitrate levels and are attributed to groundwater recharge from sewer pipe leakage and possibly to fertilizer introduced by irrigation return flows. Elevated chloride and total dissolved solids levels are most likely due to a combination of leaky sewer pipes, historic and current sea water intrusion, and connate water (DWR 2004).

Table 3.8-1 lists contaminant groups most frequently found to exist in the groundwater resources in the San Francisco Bay Hydrologic Region, which includes the nine-county Bay Area (Counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Surface Water Resources

Most of the proposed project area is completely paved and developed. No waters of the U.S. or wetlands are present within the proposed project area. The closest surface water bodies are China Basin Channel and San Francisco Bay (see Figure 3.8-1). All stormwater runoff in the proposed project area is captured by the City's combined sewer system, except for storm sewers along the bayward portion of The Embarcadero that discharge directly into San Francisco Bay. The proposed project area is served by an 18-foot by 18-foot box sewer that runs along The Embarcadero, King Street, and Berry Street to a pump station at Berry and Seventh Streets. The water is transported from the pump station to a sewage treatment plant near Phelps Street and Jerrold Avenue in the southeast portion of the City.

Table 3.8-1
Most Frequently Occurring Contaminants by Contaminant Group in the San Francisco Bay Hydrologic Region

Contaminant Group	Contaminant – # of Wells	Contaminant – # of Wells	Contaminant – # of Wells
Inorganics	Iron – 57	Manganese – 57	Fluoride – 7
Radiological	Gross Alpha – 2	Radium 226 – 1	
Nitrates	Nitrates Nitrate (as NO_3) -27	Nitrate + Nitrite – 3	Nitrite (as N) – 1
Pesticides	Di(2-Ethylhexyl)phthalate – 4	Heptachlor – 1	
VOCs/SVOCs	PCE – 4	Dichloromethane – 3	TCE– 2

Notes:
PCE = tetrachloroethylene; SVOC = semivolatile organic compound; TCE = trichloroethylene; VOC = volatile organic compound
Source: DWR 2003

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning water resources, stormwater management, flood hazards, and water quality, including new guidance issued since the 2004 FEIS/EIR.

Federal

Clean Water Act

The federal Clean Water Act (CWA) (33 USC Section 1257 et seq.) requires states to set standards to protect water quality. The objective of the federal CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Specific sections of the CWA control discharge of pollutants and wastes into marine and aquatic environments.

Section 401 – Clean Water Quality Certification

Under Section 401 of the CWA, water quality certification is required from the state for any activity that requires a federal permit or license that may result in discharge into navigable waters. The certification must indicate that the activity will comply with the applicable state water quality standards. Under Section 401, states are also required to establish water quality standards for all state waters. To receive certification under Section 401, an application must demonstrate that activities or discharges into waters will not cause concentrations of chemicals to exceed state standards. The authority that grants water quality certification for the project is the State Water Resources Control Board (SWRCB); for the project area, applications for certification under CWA Section 401 are processed by the San Francisco Bay RWQCB.

Section 402 – National Pollutant Discharge Elimination System Program

Point-source discharges to surface water are regulated by Section 402 of the CWA through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. Storm water discharges associated with construction activities and certain categories of industrial activities, incidental non-storm-water discharges associated with construction, and municipalities of a certain size fall under this act and are addressed through general NPDES permits. In California, requirements of the CWA regarding regulation of point-source discharges and stormwater discharges are delegated to the SWRCB and administered by the nine RWQCBs. The San Francisco Bay RWQCB implements the statewide policy in the proposed project area. Under California's NPDES program, any waste discharger subject to the NPDES program must obtain coverage under the appropriate general NPDES permit from the local RWQCB.

Executive Order 11988 (as amended by Executive Order 13690)

EO 11988 (Floodplain Management) directs all federal agencies to avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Requirements for compliance are outlined in Title 23, CFR, Part 650, Subpart A, "Location and Hydraulic Design of Encroachment on Floodplains."

If the proposed project involves significant encroachment into the floodplain, the final environmental document (final EIS or finding of no significant impact) must include the following:

- the reasons why the proposed action must be located in the floodplain,
- alternatives considered and why they were not practicable, and
- a statement indicating whether the action conforms to applicable state or local floodplain protection standards.

According to the Federal Transit Administration (FTA), maps of the Federal Insurance Administration should be consulted to determine if the proposed project site is located within the 100-year floodplain. If the proposed project is located within a floodplain, a detailed analysis should be included of the environment. The analysis should discuss any risk to, or resulting from, the action; the impacts on natural and beneficial

floodplain values; the degree to which the action provides direct or indirect support for development in the floodplain; and measures to minimize harm or to restore or preserve the natural and beneficial floodplain values affected by the project.

If the proposed project involves significant encroachment of the floodplain, the final environmental document must include the following:

1. FTA's finding that the proposed action is the only practicable alternative, and

2. supporting documentation reflecting consideration of alternatives to avoid or reduce adverse impacts on the floodplain.

Significant encroachment would involve one or more of the following impacts:

- a considerable probability of loss of human life;

- likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility; and

- a notable adverse impact on natural and beneficial floodplain values.

Expansion of a facility already located within a floodplain usually would not be considered a significant encroachment.

As described in Section 3.8.2, Affected Environment, EO 11988, amended by EO 13690, established the Federal Flood Risk Management Standard (Standard), as well as a process for further soliciting and considering stakeholder input. EO 13690 will eventually merge discussions of the 100-year floodplain with flood hazards associated with sea-level rise; however, implementing guidelines are still under development at this time. The intent of EO 13690 is to improve the resilience of communities and federal assets against the impacts of flooding.

The key amendment resulting from EO 13690 is to Section 6(c) of EO 11988, which defines the term "floodplain." The pertinent floodplain (since the passage of EO 11988 in 1977) has been the 100-year floodplain, normally defined by FEMA maps. EO 13690 states that federal agencies shall issue or amend their existing floodplain management regulations following a public comment period (EO 11988 Section 2[d]) and that one of the following alternative approaches must be used for determining whether a proposed action will be located in a floodplain (The White House 2015):

- The elevation and flood hazard area determined based on "climate-informed science… [using] the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science," with "an emphasis based on whether the action is a critical action";

- The elevation and flood hazard area reached by adding an additional 2 feet to the base flood elevation for non-critical actions and by adding an additional 3 feet to the base flood elevation for critical actions;[3]

[3] "Critical action" means any activity for which even a slight chance of flooding would be too great (e.g., essential buildings and facilities such as hospitals, water treatment and wastewater treatment facilities, communications, and emergency response services; structures likely to contain occupants who may not be sufficiently mobile). [EO 11988 Section 6(d)]

- The area subject to flooding by the 0.2 percent annual flood (500-year flood); or
- The elevation and flood hazard area resulting from an update to the FFRMS [FEMA's mapping system].

If a federally funded project is determined to be located in a floodplain according to this new definition, "natural systems, ecosystem processes, and nature-based approaches" should be considered, where possible, when developing alternatives (Id., Section 2(a)(2), as amended). Section 3 of EO 13690 states the process to solicit input from stakeholders and directs FEMA to draft amended Floodplain Management Guidelines to implement EO 11988. Section 4 of EO 13690 calls for the Standard to be reassessed annually and updated every 5 years, to take into account changes to climate and other changes in flood risk, based on accurate and actionable science.

National Flood Insurance Act

The National Flood Insurance Act (42 USC Section 4001 et seq.) addresses both the need for flood insurance and the need to lessen the devastating consequences of flooding.

Floodplain Management and Protection and Flood Disaster Protection Act

Floodplain Management and Protection (U.S. Department of Transportation Order 5650.2) and the Flood Disaster Protection Act (42 USC Sections 4001 to 4128) require identification of flood-prone areas, provide insurance, and require purchase of insurance for buildings in SFHAs.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on water resources and water quality, and to avoid or mitigate those impacts when feasible.

Porter–Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) established the SWRCB and nine RWQCBs as the primary state agencies with regulatory authority over water quality and surface water rights allocation. Wastes that cannot be discharged directly or indirectly to waters of the state (and therefore must be discharged to land for treatment, storage, or disposal) are classified to determine specifically where such wastes may be discharged. This classification requirement applies to dredged material or fill that would be disposed in an upland environment.

Applicable water quality protection regulations include SWRCB Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Water in California," which generally restricts dischargers from reducing the water quality of surface water and groundwater. The proposed project area is within the jurisdiction of the San Francisco Bay RWQCB. The Basin Plan (RWQCB 2010) designates beneficial uses for specific surface water and groundwater resources, establishes water quality objectives to protect those uses, and sets forth policies to guide the implementation of programs to attain the objectives.

Pursuant to the Porter-Cologne Act, the RWQCB is authorized to issue individual permits to allow for discharge of specified quantities and qualities of waste to land or surface waters. The limitations placed on the discharge are designed to ensure compliance with water quality objectives in the Basin Plan.

NPDES Permit for Construction

The objective of the NPDES program is to control and reduce discharges of pollutants to water bodies in surface water discharges. Under Section 402 of the CWA, the RWQCBs are delegated authority by the Environmental Protection Agency to implement and enforce the NPDES program within California. The City is required by federal, state, and local laws to implement programs that reduce the discharge of pollution to the local storm drain system. Construction activities located in the separate sewer area of the City that disturb 1 or more acres of land surface are regulated under the statewide NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ and as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ) (SWRCB 2009, 2012). Coverage under the NPDES Construction General Permit is not required for projects in areas of San Francisco that drain to the combined sewer system.

To obtain coverage under the Construction General Permit, the legally responsible person must electronically file the Permit Registration Documents, which include a Notice of Intent, Storm Water Pollution Prevention Plan (SWPPP), risk assessment, site map(s), and drawings, and the appropriate permit fee to the SWRCB and RWQCB.

Local

San Francisco Stormwater Design Guidelines

The San Francisco Public Utilities Commission (SFPUC) enforces a Pretreatment Program by regulating discharges from non-domestic sources into the City's sewerage system. A Batch Industrial Wastewater Discharge Permit is required for dewatering effluent discharge to the combined sewer system. The quality of the effluent needs to meet the NPDES General Permit (NPDES No. CA0037681) discharge standards. If soil sampling and analysis indicate the presence of hazardous waste in soil subject to construction disturbance, a Site Mitigation Plan is required.

The San Francisco Stormwater Design Guidelines, which were adopted by the SFPUC on January 12, 2010, describe requirements for stormwater management and provide tools to achieve compliance. The Stormwater Management Ordinance became effective on May 22, 2010. Projects that disturb 5,000 or more square feet of ground surface or surface over water are required to comply with the San Francisco Stormwater Design Guidelines. Projects subject to the Stormwater Design Guidelines are required to submit a Stormwater Control Plan to the SFPUC, and complete, sign, and record a Maintenance Agreement.

Pursuant to San Francisco's Stormwater Design Guidelines (SFPUC and Port of San Francisco 2009), drain inserts or water quality inlets should be considered to be placed within drainage catch basins and further investigated during the design phase of a project. Implementing such measures would help to prevent sediment from entering local sanitary storm sewers, which can damage sewers or pass through treatment plants into receiving waters.

Construction Site Runoff Control Program

In November 2013, the Board of Supervisors approved and the Mayor signed the Construction Site Runoff Control Ordinance (Ord. 260-13), which amended Article 4.2 of the Public Works Code to add pollution prevention controls for construction site runoff discharges into the sewer system citywide. Under the ordinance, any construction project that disturbs 5,000 square feet or more of land must apply to the SFPUC for a Construction Site Runoff Control Permit before the start of work and must submit an erosion and sediment control plan (ESCP) that sets forth best management practices (BMPs) intended to control erosion control and sediment. The ESCP must include a vicinity map, showing the location of the site in relationship to the surrounding area's water courses, water bodies, and other significant geographic

features; a site survey; suitable contours for the existing and proposed topography, area drainage, proposed construction and sequencing, proposed drainage channels: proposed erosion and sediment controls; dewatering controls where applicable: soil stabilization measures where applicable; maintenance controls; sampling, monitoring, and reporting schedules; and any other information deemed necessary by SFPUC (SFPUC and Port of San Francisco 2015). Any project requiring an SWPPP under the Construction General Permit may submit the SWPPP in lieu of an ESCP to comply with the Construction Site Runoff Control Program requirements.

3.8.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;
- 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;
- otherwise substantially degrade water quality;
- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, FIRM, or other flood hazard delineation map;
- place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- expose people or structures to a significant risk of inundation by seiche, tsunami, and mudflow.

Issues Not Addressed Further in this SEIS/EIR

Inundation by Seiche, Tsunami, and Mudflow. The proposed project is located in an area that is not delineated as a potential inundation or tsunami-affected area in the San Francisco Tsunami Inundation Map (see Figure 3.8-5). Mudflows are not a risk because the proposed project area is located on, and is surrounded by, relatively level terrain and urban development. Therefore, no impacts resulting from inundation by seiche, tsunami, or mudflow would occur, and no mitigation measures are required. Accordingly, no further analysis of impacts related to inundation by seiche, tsunami, and mudflow is provided in this section.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the water resources and water quality effects will be the same as those presented in Section 5.10 Water Resources (pages 5-80 to 5-81) of the 2004 FEIS/EIR and the subsequent addenda, with the exception of flood hazards. A summary of those previously analyzed effects and Mitigation Measures HMC 2 through HMC 7, previously adopted and incorporated into the Transbay Program, is provided below. The full text of these mitigation measures is provided in Appendix C of this SEIS/EIR.

Flood Hazards. The 2004 FEIS/EIR and addenda found that the Transbay Program will have no effect/no impact related to floodplains because, at the time of its approval, the City did not participate in the FEMA floodplain insurance program, and no floodplains were identified within San Francisco (FTA 2004). However, since that time, FEMA issued preliminary FIRMs for the City in 2007, the City prepared interim floodplain maps in July 2008, and FEMA prepared revised preliminary FIRMs for the City in 2013. In addition, EO 13690 amending EO 11988 was signed, which modified the acceptable approaches for determining whether a proposed action will be located in a floodplain.

The DTX project in relationship to preliminary mapped FEMA flood hazard areas is shown in Figure 3.8-1. Based on the 2013 preliminary FEMA FIRM shown in Figure 3.8-1, none of the Transbay Program components will be located within a special flood hazard area. Moreover, the current DTX Design Criteria further ensures protection from flood hazards, as delineated in the 2013 preliminary FEMA FIRM. The DTX Design Criteria contains specific standards and specifications that will be followed in the design and construction of the DTX project. Chapter 23 of the DTX Design Criteria specifically deals with design features to avoid flooding in below-ground portions of the DTX project. Among the DTX Design Criteria dealing with flood protection are the following:

- Underground rail facilities shall be designed to remain operational for flood levels up to and including the 100-year flood and to prevent inundation of the DTX system for flood levels up to and including the 500-year flood.

- The DTX design shall incorporate a means of maintaining a minimum of 12 inches of freeboard above the 100-year flood elevation at the DTX tunnel portal, entrances to the Fourth and Townsend Street Station, and other points of access to the DTX system.

- The design shall incorporate interception points at the tunnel portal location to collect flow during the design storm event.

- Where portions of the project are within the 100-year flood plain or may be affected by other portions of the project within the 100-year flood plain, the drainage facilities shall be designed for the 100-year flood condition.

- Station entrances shall be designed to maintain a minimum of 12 inches of freeboard above the 100-year flood elevation, and shall incorporate provisions to prevent flooding of the station and inundation of the DTX alignment during a 500-year flood event.

Groundwater Resources and Quality. The piles that will be used to support portions of the DTX will be underlain by bay mud and could create a conduit for contaminants in shallow groundwater to migrate to deeper groundwater zones. However, the geotechnical properties of bay mud suggest that a tight seal will

develop around the piles, which will minimize downward migration of contaminated groundwater. The 2004 FEIS/EIR concluded that no effect/no impact will occur to groundwater resources.

Surface Resources and Storm Water Runoff. No portions of the Transbay Program area will encounter surface water bodies, including creeks or reservoirs. The design of the tunnel portion includes a sump pump at its low point to collect and discharge tunnel drainage. Storm water related to the DTX will discharge to the City's combined storm/sanitary sewer system. The 2004 FEIS/EIR concluded that no effect/no impact will occur regarding surface resources and stormwater runoff.

Construction. Construction of the No Action Alternative may involve erosion/sedimentation and dewatering, given the shallow groundwater in portions of the project area, as described below.

- Ground-disturbing activities such as grading, tunneling, and utility excavations will increase the sediment load to storm sewers during rainfall events. Sediment sources during construction include soil stockpiles; soil tracked across construction areas, staging areas, and public roads; and soil transported to these areas by wind. Because stormwater in the project area discharges to the City's combined storm/sanitary sewer system, sediment transported by stormwater will not affect surface water bodies in the project area (China Basin and San Francisco Bay). However, wind-transported soils can contain contaminants that will affect nearby surface waters (China Basin Channel or San Francisco Bay).

- Most of the Transbay Program area is already completely paved and developed and will not include construction of substantial new impervious surfaces that will increase the amount of runoff or impede groundwater recharge. The impact on aquifer systems and groundwater movement is anticipated to be minimal because of the small percent of the volume of excavation compared with the overall groundwater basin size.

- Dewatering during construction is anticipated, which can promote the downward migration of contaminants from the uppermost groundwater zone to deeper groundwater zones. If dewatering lowers the water table in areas where free-phase petroleum hydrocarbons are floating on the water table, the resulting decrease in the water-table elevation will smear the hydrocarbons across soils that otherwise may be affected only minimally.

To mitigate construction-related impacts on water resources and water quality, the TJPA adopted and incorporated into the Transbay Program several mitigation measures that are being implemented as part of Phase 1 construction. These mitigation measures for hazardous materials also apply to water resources and water quality because they pertain to handling of soil and groundwater.

- **HMC 2 –** prior to construction, investigate the potential presence of contaminants in soil and groundwater. Based on the chemical test results, develop a mitigation plan that follows the requirements of Article 22A.

- **HMC 3** – cover soils removed during excavation and grading to prevent fugitive dust.

- **HMC 4** – use a licensed waste hauler to dispose of soil at a landfill or recycling facility.

- **HMC 5 –** use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works, and if contamination occurs, apply appropriate treatment.

- **HMC 6 –** prior to starting project construction, develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater.

- **HMC 7 –** design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions.

The 2004 FEIS/EIR concluded that the Transbay Program will have a no adverse effect/less-than-significant impact on water resources and water quality during construction with implementation of the above mitigation measures.

Proposed Project

The proposed project components consist of Phase 2 refinements and other transportation improvements and adjacent land development at or adjacent to elements of the previously approved Transbay Program, which was analyzed in the 2004 FEIS/EIR and addresses water resources and water quality impacts; therefore, the previous analysis covers the area directly relevant to the proposed project. The assessment below is therefore substantially similar to the 2004 FEIS/EIR, although more current information and technical analyses have been incorporated to refine potential water resources and water quality impacts for the proposed project. For example, the proposed locations of the vent structures have been updated since the 2004 FEIS/EIR. Mitigation Measures HMC 2 through HMC 7, which were previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, will continue to apply to the water resources and water quality impacts identified for the proposed project and would be implemented. The full text of these mitigation measures is provided in Appendix C of this SEIS/EIR.

Impact WQ-1: The proposed project would not violate water quality standards or waste discharge requirements. (No Adverse Effect/Less-than-Significant Impact)

The proposed project would not change the types of construction activities evaluated in the 2004 FEIS/EIR for the Phase 2 components; however, specific locations for the project components and additional components have been identified. Below-grade proposed project components would not affect surface runoff quality. Specifically, the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, rock dowels, and underground pedestrian connector would be underground and covered when complete, and, therefore, would have no effect on surface water resources or stormwater runoff quality.

Some of proposed project components, which are listed below, are located at sites with existing impervious or heavily compacted surfaces and, thus, would not substantially change runoff volumes or the pollutant constituents in the stormwater runoff:

- the vent structures at the Fourth and Townsend Station would be constructed in an area currently developed as the Caltrain railyard;

- the vent structure at 701 Third Street and adjacent land development would be constructed on a site occupied by a fast food restaurant and associated surface parking;

- the alternate vent structure location at the northeast corner of Third and Townsend Streets would be constructed on a site occupied by retail and commercial buildings;

- the vent structure at Second and Harrison Streets would be developed on a site occupied by a surface parking lot;

- the additional trackwork (turnback track and maintenance of way [MOW] storage track) would be constructed within the existing Caltrain right-of-way that already is developed and used for rail operations;

- the intercity bus facility and adjacent land development would be constructed in an area currently developed with offices and parking spaces on the south side of the 201 Mission Street office tower;

- the taxi staging area would be within the existing roadway;

- the bicycle/controlled vehicle ramp would be constructed in an area that is currently used for constructing Phase 1 of the Transbay Program; and

- the AC Transit bus storage facility parking would not be altered except that it would be used by the general public for parking in the evenings for events when not being used for bus operations.

None of the proposed project component sites are near surface waters. The MOW storage track would be the project component closest to a surface water body, the China Basin Channel, but it would be approximately 300 feet away at its closest point, south of three other sets of existing tracks. The proposed tunnel stub box would be approximately 600 feet north of the edge of the basin; however, it would be located underground. The extended train box and the intercity bus facility would be the closest proposed project components to San Francisco Bay; however, they would be located more than 1,000 feet away. Therefore, surface water in the proposed project area would not be affected by discharges from proposed project components.

The proposed project components would not impact surface or groundwater resources, because stormwater from them would be conveyed to the City's combined storm/sanitary sewer system and sediment transported by stormwater would not affect surface water bodies in the proposed project area (China Basin Channel and San Francisco Bay). In addition, the proposed project components would be required to comply with the City's Stormwater Design Guidelines. Compliance with applicable regulations and standards would minimize the discharge of pollutants into the San Francisco Bay.

Based on the above analysis, the proposed project would not violate water quality standards or waste discharge requirements and its effect on water resources and water quality would be not adverse under NEPA and less than significant under CEQA.

Impact WQ-2: The proposed project would not substantially deplete groundwater supplies or interfere with groundwater recharge. (No Adverse Effect/Less-than-Significant Impact)

The proposed project would not involve construction of substantial new impervious surfaces that would impede groundwater recharge. As discussed under Impact WQ-1, the proposed project components would either be located underground and covered when completed and not impede the limited recharge that occurs in the project area, or would involve redevelopment of existing impervious sites (e.g., streets, parking lots, fully developed properties, and existing Caltrain right-of-way) and would, therefore, have no effect on the recharge of water.

The impact on aquifer systems and groundwater movement is anticipated to be minimal because of the small percent of the volume of underground facilities compared to the overall groundwater basin size. The widened throat structure and extended train box at either end of the Transit Center represent an approximate 20 to 25 percent increase to the volume of the train box originally evaluated in the 2004 FEIS/EIR. The vent structures are either part of the proposed underground stations or would be additions

to the original DTX and comprise a negligible addition to those facilities from what was originally planned and approved in the 2004 FEIS/EIR. The underground pedestrian connector under Beale Street would be similar to the other connector options, farther to the west, that were considered in the 2004 FEIS/EIR, and represents a new preferred alignment. Because each of these proposed project components constitutes small additions to the approved DTX facilities, their effects on groundwater movement are anticipated to be minor.

The one new underground facility that was not covered in the 2004 FEIS/EIR is the tunnel stub box planned to be under the Caltrain railyard. However, its impact on groundwater supply and flow is anticipated to be minimal, because of the small percent of the volume of excavation compared with the overall groundwater basin size. Potential permanent dewatering, if necessary, would be minimized to the extent practicable with the use of watertight seals or other applicable BMPs.

Based on the above analysis, the proposed project would not substantially deplete groundwater supplies or interfere with groundwater recharge, and its groundwater effect would be not adverse/less than significant.

Impact WQ-3: The proposed project would not substantially alter drainage patterns in the project area or create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. (No Adverse Effect/Less-than-Significant Impact)

The proposed project would not involve the direct modification of any watercourse because none exist in the project area. All stormwater runoff in the proposed project area would be captured by the City's combined sewer system, as explained above, with one exception: storm sewers along the bayward portion of The Embarcadero discharge directly into San Francisco Bay. As described under Impact WQ-1, all proposed project component sites that would be at the street level are already completely paved or compacted, and their future development as part of the proposed project would not alter drainage patterns or contribute substantially to flows to the combined sewer system (these sites are at the proposed vent structures, the additional trackwork south of the Caltrain railyard, the intercity bus facility, the taxi staging area, the bicycle/controlled vehicle ramp, and the AC Transit bus storage facility). This means that at these sites, the stormwater runoff under existing conditions already drains into the combined sewer system and the fully urbanized condition of these sites means that greater runoff volumes would not be expected.

Other proposed project components are underground (i.e., the widened throat structure, the extended train box, the realigned Fourth and Townsend Street Station, the tunnel stub box, rock dowel installation, and the underground pedestrian connector) and would not affect surface drainage patterns or substantially alter stormwater flows into the combined sewer system. Underground components, such as the tunnel portion, would be designed with drainage facilities and possibly sump pumps that may discharge to the combined sewer systems. Consequently, some contribution to flows in the combined sewer system would be expected, but it is reasonable to assume that they could be accommodated without the need for new infrastructure because the stormwater volumes to be discharged would be minimal. As a result, the proposed project would not involve the construction of substantial new impervious surfaces that would increase the amount of runoff, resulting in erosion or siltation, or affecting flooding on or off the site.

In summary, there would be no new or substantially more severe significant impact related to alteration of existing drainage patterns.

Impact WQ-4: The proposed project would not expose life or structures to substantial flood hazards or flooding. (No Adverse Effect /Less-than-Significant Impact with Mitigation)

As shown in Figure 3.8-1, proposed project would not be subject to inundation, because the 2013 preliminary FEMA FIRM that delineates the 100-year flood hazard area does not show any of the proposed project component sites within the floodplain.

Because EO 13690 establishes a new definition for floodplains, because the proposed project would be implemented at some future date, and because a key role of an environmental document is to provide full disclosure, this SEIS/EIR analyzes the potential impact using the approaches identified in EO 13690 for a floodplain, which expand the area of flood hazards that are delineated by the 2013 preliminary FEMA FIRM and provide a more conservative assessment of exposure to flooding that takes into account possible future conditions (i.e., sea-level rise). Based on the floodplain definitions in accordance with EO 13690, flood hazard risks for the proposed project are described below.

- Figure 3.8-1 shows that the extended train box, vent shaft and emergency exit at the Transit Center, intercity bus facility, and taxi staging area would be within the 500-year floodplain.

- Figure 3.8-2 shows the same proposed project components in addition to the project site from approximately Fourth Street to Irwin Street would be within the floodplain defined as the 100-year flood base flood elevation (10 feet) plus 2 feet.

- Figures 3.8-3 and Figures 3.8-4 show flooding hazards that are based on conservative, worst-case climate-informed science projections. Figure 3.8-3 shows that the project site would not be inundated in the 2050 worst-case sea-level rise scenario. Figure 3.8-4 shows that the proposed project components identified above would be inundated by up to 6 feet of water by 2100, when taking into account worst-case, conservative sea-level rise assumptions and using an MHHW tidal datum.

For the purposes of this SEIS/EIR, the alternative approach considering the 100-year base flood elevation plus 2 additional feet (Figure 3.8-2) is used for several reasons: 1) it is the most concrete, numeric standard available with which to develop mitigation, 2) the assumptions used in the climate informed science approach are worst case, conservative estimates based on evolving scientific methods which may overstate flood risks because they illustrate the greatest depth and areal extent of flooding, and 3) the alternative approach identified in EO 13690, based on climate informed science, does not currently have a specified time horizon for evaluation purposes. Using this approach, the proposed project would be vulnerable to flood hazards and the effects would be adverse/significant without mitigation measures.

As described in the Regulatory Framework, if the proposed project is located within a floodplain, FTA requires an analysis of the risk to, or resulting from, the action; the impacts on natural and beneficial floodplain values; the degree to which the action provides direct or indirect support for development in the floodplain; and measures to minimize harm or to restore or preserve the natural and beneficial floodplain values affected by the project. The proposed project components would primarily be below ground and would not occupy flood storage space within the floodplain, and therefore would have minor potential to result in substantial encroachment into a floodplain or to alter the floodplain. Project elements would not result in a change in impervious surface area, increase fill inside the floodplain, or result in a change in the 100-year water surface elevation. Therefore, the proposed project would not adversely affect natural and beneficial floodplain values. The project vicinity is already urbanized and additional development supported by the proposed project would not be subject to greater flood hazards as a result of the proposed project. Because the proposed project components are largely refinements to the approved DTX, the siting and plans for the proposed project components are dictated by the approved rail corridor,

station locations, and facilities, and options to relocate the proposed project components outside the floodplain are not practicable or feasible.

Mitigation Measure. As described above, flooding impacts would not occur as a result of the proposed project; however, the project would be exposed to flood hazards and would have to be protected from flooding. With implementation of New-MM-WQ-4.1, protection from the flood depths defined as 100-year base flood elevations plus 2 feet would be provided. As a result, no adverse effect would occur under NEPA, and a less-than-significant impact would occur under CEQA.

New-MM-WQ-4.1 Modify DTX Design Criteria to Avoid Flood Hazards. The TJPA shall modify the DTX Design Criteria to protect project elements from the EO 13690-defined flood hazard. Specifically, the TJPA shall design and construct Transbay Program Phase 2 within the area delineated as being within a floodplain, as defined as the 100-year flood elevation plus 2 feet consistent with EO 13690, to prevent inundation of the project rail alignment and associated infrastructure and to remain operational for the predicted flood level. Changes to the current DTX Design Criteria will include designing station entrances and other points of access to below-ground portions of the DTX system, to maintain the required 2 feet of freeboard above the 100-year base flood elevation. Changes to the design criteria will be completed prior to the next phase of design so that these new standards can be incorporated in the design of the next phase. In updating project designs to meet the modified DTX Design Criteria, the TJPA shall consider the cost-benefit of flood-proofing measures and designs that do not preclude other measures that may be more practicable and effective when the future flood risks become more evident. Because implementation of the proposed project would occur at a future date, the TJPA shall amend and update the DTX Design Criteria to incorporate new information related to San Francisco's FEMA FIRM or climate-informed science predictions and mapping of sea-level rise.

Refer to Impact CU-WQ-9 for a discussion of flooding impacts associated with sea-level rise.

Impact WQ-5: The proposed project would not place housing within a 100-year flood hazard area. (No Effect/Less-than-Significant Impact)

The proposed adjacent land development components include residential uses at Second and Harrison Streets adjacent to a vent structure, mixed uses at Third and Townsend Streets adjacent to a vent structure, and mixed uses above the intercity bus facility. No levees or dams exist that could breach or rupture and inundate the proposed project area. None of these sites is within the 100-year flood hazard area as shown in Figure 3.8-1, but the mixed uses above the intercity bus facility are within the 500-year flood hazard area (Figure 3.8-1) and within the 100-year flood base flood elevation (10 feet) plus 2 feet (Figure 3.8-2), which are two of the approaches to define a floodplain set forth in EO 13690.

Although the intercity bus facility and the adjacent land development are within the floodplain as defined by EO 13690, the housing option of the mixed use development would be above the bus facility approximately more than 40 feet above the street level. Moreover, the City's Floodplain Management Ordinance requires new structures located in a designated flood hazard area be protected against flood damage, with either the first floor of the structure constructed above the base flood elevation, or the structures must be flood-proofed. The Department of Building Inspection is responsible for reviewing all development permit applications to determine whether the permit requirements of this ordinance have

been satisfied and whether the site is reasonably safe from flooding. The proposed design of the mixed used development and compliance with the Floodplain Management Ordinance requirements would result in a no indirect adverse effect under NEPA and a less-than-significant impact under CEQA.

Impact C-WQ-6: The proposed project would not violate water quality standards or waste discharge requirements during construction. (No Adverse Effect/Less-than-Significant Impact)

The proposed project would not change the types of construction activities evaluated for the Transbay Program in the 2004 FEIS/EIR; i.e., the proposed project would require demolition, excavation, and grading similar to activities analyzed in the 2004 FEIS/EIR. Similar to the approved Transbay Program, the construction activities associated with the proposed project could impact water quality due to soil erosion, exposed work areas, spillage from mechanical equipment and haul trucks, or suspended solids being introduced into waterways.

The proposed project components would not involve substantial excavations that affect groundwater resources. With the exception of the additional trackwork south of the Caltrain railyard (i.e., the turnback track and MOW storage track), intercity bus facility, the taxi staging area, and the AC Transit bus storage facility parking, all of the proposed project components would be situated below or near the groundwater table. Therefore, construction for most of the proposed project components may require dewatering. The intercity bus facility, taxi staging area, and AC Transit bus storage parking each would be constructed at-grade and involve minimal grading, so that groundwater dewatering is not expected to be needed during construction. Should dewatering be necessary, the mitigation measures already adopted and incorporated into the Transbay Program and existing NPDES permit standards, as described below, would apply to the proposed project and reduce this effect.

The proposed project would result in soil disturbance of more than 5,000 square feet, and because it would be located in the combined sewer area of the City, it would be required to apply for a Construction Site Runoff Control Permit from the SFPUC and to submit an ESCP that sets forth BMPs intended to control erosion control and sediment. The following minimization measures would be used for keeping sediment and suspended solids from entering the waterways, in compliance with the ESCP: (1) requiring the contractor to submit a ESCP prior to the start of construction, (2) requiring the contractor to submit a dewatering plan (if dewatering is needed) and obtaining a Batch Industrial Wastewater Discharge Permit if the effluent is discharged to the City's sewerage system, and (3) implementing permanent erosion-control BMPs.

Dewatering effluent would be discharged into the sanitary sewer. The quality of the effluent would need to meet the NPDES General Permit (NPDES No. CA0037681) discharge standards. Potential permanent dewatering effluent would also be discharged to the combined sewer system in compliance with an Industrial User Permit required by the SFPUC. Therefore, temporary and permanent dewatering, if necessary, would not affect surface waters or groundwater resources.

Potential construction impacts on water quality would be less than significant because Mitigation Measures HMC 2 through HMC 7, previously identified in the 2004 FEIS/EIR and adopted and incorporated into that project, would apply to the proposed project and would be implemented as part of the proposed project. These measures would require appropriate handling of contaminated soil and groundwater, treatment of effluent produced during dewatering to reduce the sediment load and contaminants, designing dewatering to minimize downward migration of contaminants, and covering soils removed during excavation and grading. Potential impacts on water quality from construction would be minimized with implementation of the ESCP and any required discharge and dewatering requirements, and compliance with applicable federal, state, and local regulations.

Excavation spoils would be appropriately managed using BMPs to minimize wind dispersion of potentially contaminated soil particles. Sediment would settle through the use of BMPs to reduce elevated metals concentrations that could result from high quantities of suspended sediment.

Cumulative Analysis

Impact CU-WQ-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative water quality impacts. (No Adverse Effect/Less-than-Significant Impact)

The geographic area of potential water quality and hydrology cumulative impacts is defined as the area within the Transbay Program, Transit Center District Plan, and Central SoMa Plans. These areas are already heavily developed and covered with impervious surfaces. The proposed project would require ground-disturbing activities during construction that could impact water quality due to soil erosion, exposed work areas, spillage from mechanical equipment and haul trucks, or suspended solids being introduced into waterways. Cumulative projects also have the potential to degrade water quality because of construction activities, further reductions in open space and other previous surfaces, and changes in intensity and types of land use. The proposed project, combined with other past, present, and reasonably foreseeable future projects, would result in no cumulatively adverse effect/less-than-significant impact on water quality because construction of the cumulative list of projects would be required to comply with the NPDES permit and waste discharge requirements and the City's Construction Site Runoff Control Ordinance. The regulatory framework described in Section 3.8.2, Affected Environment, identifies the federal, state, and local ordinances and regulations that would protect water quality during construction and post-construction. The cumulative projects would also be required to comply with applicable NPDES permits, the City's stormwater control guidelines, the requirement to prepare a SWPPP or ESCP, and discharge requirements concerning dewatering activities, and would reduce water quality impacts on surface waters and groundwater to the maximum extent practicable. Therefore, cumulative impacts on water quality would be not adverse under NEPA and less than significant under CEQA.

Impact CU-WQ-8: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative flood hazard impacts. (No Adverse Effect /Less-than-Significant Impact with Mitigation)

As shown in Figures 3.8-2 through 3.8-4 (floodplains per EO 13690), the proposed project components would be within a floodplain. Because proposed project components primarily would be below ground, the proposed project would have minor potential to result in substantial encroachment into a floodplain or to alter the floodplain. Similarly, other cumulative projects in the flood hazard areas in this portion of the City would involve redevelopment of existing developed sites and thus would not be expected to substantially diminish floodplain storage capacity or values. As a result, the cumulative effect of past, present, and reasonably foreseeable development to expand the areal extent of the floodplain or to reduce floodplain beneficial values would not be adverse under NEPA and would be less than significant under CEQA.

By contrast, the proposed project in combination with other cumulative projects identified in Table 3.1-1 and illustrated in Figure 3.1-1 would be subject to flood hazards. This exposure to flood risks, particularly with the more expansive definition of a floodplain pursuant to EO 13690, would indicate a cumulative adverse effect/significant impact for development in this portion of the City.

As shown in Figure 3.8-5 (tsunami hazards), the proposed components would not occur within the tsunami inundation area. Therefore, the proposed project, combined with other past, present, and

reasonably foreseeable future projects, would have no effect on cumulative impacts with respect to exposure to tsunami hazards.

Implementation of New-MM-WQ-4.1 would reduce the proposed project's effect to less than cumulatively considerable. With this mitigation measure offsetting potential risks of flood hazards for the proposed project, the cumulative effect would be reduced to not adverse under NEPA and less than significant under CEQA.

Impact CU-WQ-9: Sea-level rise due to climate change is not projected to inundate portions of the project area in 2050, but would inundate portions of the project area by 2100. (Significant and Unavoidable Impact)

Sea-level rise is analyzed here as a cumulative effect, because it is the result of global contributions to greenhouse gas emissions. This analysis does not examine the proposed project's greenhouse gas emissions, which are evaluated in Section 3.14, Greenhouse Gases and Climate Change. Rather, the assessment here considers the effects of sea-level rise on the proposed project.

Sea-level rise projections are available for 2050 and 2100 (see Figure 3.8-3 and Figure 3.8-4). No regulations have been issued defining an appropriate time horizon for considering flooding impacts associated with sea-level rise. The FTA typically considers a horizon of approximately 25 years for assessing long-term operational effects, which means that a foreseeable future horizon would be around the year 2040. Projections for 2040 are not available, however, so sea-level rise projections for 2050 are used for this analysis. In addition, because projections are available for 2100, and because other CEQA environmental documents being prepared for the City are using these projections, an assessment of the proposed project's vulnerability to sea-level rise in 2100 also is presented for CEQA purposes only. The Council on Environmental Quality (CEQ) guidelines regarding climate change (CEQ 2014) do not require that a NEPA effect be determined, but recommend that federal agencies consider the information to help plan accordingly and to explore possible resiliency alternatives.

The proposed project would be predominantly underground, and the tracks and associated surface-level infrastructure are minimal in size relative to their surrounding areas. However, if entrances or portals to the underground facilities are within areas to be inundated by future sea-level rise and not designed to accommodate potential flood risks, the flood hazards and damages to the DTX could be substantial.

The proposed project would be constructed to standards and specifications of the DTX Design Criteria (see Impact WQ-4 and New-MM-WQ-4.1 for further information), which would prevent the inundation of the DTX system for the 100-year and 500-year flood levels. The design also would incorporate interception points at the tunnel portal location to collect flow during the design storm event, as defined in Chapter 5, Civil Design of the DTX Design Criteria. In addition, the design would incorporate provisions to prevent flooding of the station and inundation of the DTX alignment during a 500-year flood event.

As described earlier in this section, sea-level rise projections have been completed for 2050 and 2100. The Bay Area is projected to experience a range of 5 to 24 inches (0.5 to 2 feet) of sea-level rise by 2050. As shown in Figure 3.8-3, which shows a conservative, worst-case sea-level rise scenario for 2050, none of the proposed project components would be within the areas vulnerable to sea-level rise in 2050. A portion of the Caltrain railyard is within a low-lying area, but is not identified as an area vulnerable to sea-level rise in 2050 because it is hydrologically disconnected from the Mission Creek Channel and San Francisco Bay. Sea-level effects in 2050 would not inundate the project area, and would be considered less than significant under CEQA.

In contrast to future sea-level rise in 2050, there is a potential for components of the proposed project and previously approved Transbay Program to be significantly affected by sea-level rise and associated flooding in the year 2100. In particular, Figure 3.8-4 shows a more expansive area vulnerable to sea-level rise in this future year. Portions of the extended train box, vent structures, portions of the maintenance of way storage track, the intercity bus facility, and the taxi staging areas would be subject to 0 to 2 feet of flooding. In addition, proposed project components, including the realigned Fourth and Townsend Street Station and related facilities (e.g., the vent structures) and the tunnel stub box, could be inundated to depths of up to 6 feet. This climate change impact is considered significant under CEQA.

The DTX Design Criteria, as modified by New-MM-WQ-4.1, would afford protection for the proposed project from 100-year and 500-year flood events. However, these design measures would need to be augmented to address sea-level rise post-2050.

Mitigation Measure. In the 2100 timeframe, all communities along the San Francisco Bay waterfront will be facing major challenges to their essential infrastructure, including electrical distribution facilities, ports, airports, transit systems, and regional highways. To mitigate the significant CEQA impact from future sea-level rise, New-MM-WQ-4.1 and New-MM-CU-WQ-9.1 would be required to reduce the effects of sea-level rise on the proposed project. New-MM-CU-WQ-9.1, presented below, calls for a Sea-Level Rise Adaptation Plan to protect critical and non-critical infrastructure. At this time, the feasibility of implementing all resiliency measures necessary to avoid future inundation associated with sea-level rise is not known because assessment of such solutions will be an ongoing, long-term, and multi-agency process. In addition, because regional sea-level rise protection measures are under discussion presently but no firm commitment exists to strategies to implement flood protection, this CEQA impact would be significant and unavoidable.

New-MM-CU-WQ-9.1 *Prepare a Sea-Level Rise Adaptation Plan.* Based on the vulnerabilities identified from inundation maps of year 2100 sea-level rise, the TJPA will prepare a Sea-Level Rise Adaptation Plan identifying measures that will be taken to protect the new project facilities as well as the existing TJPA facilities from potential damage due to future flooding from sea-level rise. The TJPA will coordinate with other entities with facilities close to the San Francisco Bay with an equal or greater sea-level rise vulnerability, such as local jurisdictions (e.g., City and County of San Francisco), agencies (e.g., San Francisco Bay Conservation and Development Commission, the Port of San Francisco, BART, the California Department of Transportation, and the San Francisco Municipal Transportation Agency).

Specifically, the TJPA designs its infrastructure system and buildings so that they remain resilient and adaptable over time. The strategies to implement such protection will evolve from the ongoing sessions with other local jurisdictions and agencies, and the performance standard to be achieved will protect the proposed project from the sea-level rise depths as projected by the City for the year 2100. It is recognized that the flood depths may be refined over time and that new regional and citywide strategies to address sea-level rise will be identified. To the extent feasible, the TJPA shall amend and update its Adaptation Plan and the performance standard to incorporate this new information.

The TJPA shall complete the first Sea-Level Rise Adaptation Plan as part of DTX final design. The Plan shall include the following:

a. Review of available scientific information on sea-level rise data and projections for the subsequent 50 years. Where data and projections indicate different rates of sea-level rise than previously applied, the TJPA will adjust the proposed project's vulnerability assessment and flood design criteria to reflect a median-point of then-current projections.

b. Improvements will meet the flood design criteria as feasible and unconstrained by surrounding development not owned by the TJPA.

c. The plan may also rely on flood improvements implemented separate from the TJPA but that will also provide flooding benefits for Transbay Program Phase 2 facilities.

d. Opportunities for partnership with other local and regional parties for sea-level rise adaptation or where regional efforts will address flooding risks to TJPA facilities.

e. Consideration of the cost-benefit of flood-proofing measures and designs that do not preclude other measures that may be more practicable and effective when the future flood risks become more evident.

Where the TJPA's adaptation options are constrained because of adjacent infrastructure (such as adjacent roadways and structures not owned by the TJPA), the TJPA will work with adjacent landowners and infrastructure managers to identify opportunities to improve rail system protection in concert with other local or regional parties.

3.8.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Water Resources and Water Quality (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that although the potential would exist for construction-related water quality impacts, no adverse effect would occur with implementation of mitigation measures HMC 2 through HMC 7, previously adopted and incorporated into the Transbay Program. Additionally, no adverse effects were identified for water resources or from flood hazards. There was no consideration of effects from sea-level rise in the 2004 FEIS/EIR. The proposed project analyzed in this SEIS/EIR would not result in adverse effects on water resources or water quality. However, a new adverse flood hazard effect not identified in the 2004 FEIS/EIR could occur, because of new floodplain definitions based on EO 13690. With implementation of New-MM-WQ-4.1, this adverse effect would be reduced. For information purposes, sea-level rise would not affect the project area in 2050, but by 2100, some proposed project components would be vulnerable to inundation.
CEQA Summary	
Impact WQ-1: Water Quality (Less than Significant)	The 2004 FEIS/EIR concluded less-than-significant impacts on surface water or groundwater quality. The proposed project analyzed in this SEIS/EIR would result in a less-than-significant impact related to water quality standards and waste discharge requirements. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.

Impact WQ-2: Groundwater (Less than Significant)	The 2004 FEIS/EIR concluded less-than-significant impacts on groundwater resources. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts on groundwater resources. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact WQ-3: Storm Water Drainage Systems (Less than Significant)	The 2004 FEIS/EIR concluded less-than-significant impacts on stormwater drainage systems, with runoff being discharged to the City's existing combined sewer system. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts on drainage patterns and runoff from the proposed project. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusion. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact WQ-4: Flooding (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded no flood hazard risks, because no portions of the project area would be within recognized flood hazard zones with the exception of potential tsunami inundation. The proposed project analyzed in this SEIS/EIR would result in potentially significant flood hazard impacts based on EO 13690. Therefore, the proposed project would change the significance conclusion in the 2004 FEIS/EIR. With implementation of New-MM-WQ-4.1, the impact would be mitigated to a less-than–significant level.
Impact WQ-5: Housing within a 100-Year Flood Hazard Area (Less than Significant)	The 2004 FEIS/EIR concluded no flood hazard risk because no portions of the project area would be within the 100-year flood hazard zones. The proposed project analyzed in this SEIS/EIR would result in a less-than-significant impact on housing within the 100-year flood hazard area, even when considering the EO 13690 approaches for determining the floodplain. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact C-WQ-6: Construction – Water Quality (Less than Significant)	The 2004 FEIS/EIR concluded that with mitigation construction water quality impacts would be less than significant. The proposed project analyzed in this SEIS/EIR would result in less-than-significant construction impacts related to water quality. Therefore, the proposed project would not result in new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No additional mitigation measures beyond Mitigation Measures HMC 2 through HMC 7 described in the 2004 FEIS/EIR, and previously adopted and incorporated into the Transbay Program, would be required for the proposed project.
Impact CU-WQ-7: Cumulative – Water Quality (Less than Significant)	The proposed project, in combination with other reasonably foreseeable projects, would have a less-than-significant impact on water quality, and would not change the significance conclusion in the 2004 FEIS/EIR.
Impact CU-WQ-8: Cumulative – Flooding (Less than Significant with Mitigation)	The proposed project, in combination with other reasonably foreseeable projects, would result in a new potentially significant flooding impact not identified in the 2004 FEIS/EIR. The cumulative impact would be reduced to a less-than-significant level with implementation of New-MM-WQ-4.1.
Impact CU-WQ-9: Cumulative – Flooding from Sea-Level Rise (Significant and Unavoidable)	Flooding impacts as a result of sea-level rise were not identified in the 2004 FEIS/EIR. The proposed project analyzed in this SEIS/EIR would result in a less-than-significant impact related to flooding associated with sea-level rise in the year 2050; however, the impact would be significant in the year 2100. Therefore, the proposed project would result in new significant impacts not identified in the 2004 FEIS/EIR. Even with implementation of New-MM-WQ-4.1 and New-MM-CU-WQ-9.1, the impact of the proposed project would remain significant.

3.9 GEOLOGY, SOILS, AND SEISMICITY

3.9.1 Introduction

This section describes the existing geological, soils, and seismic conditions and potential impacts that are likely to result from implementation of the proposed project. Seismic activity may cause severe groundshaking and ground failure in the project area. Geologic and soil conditions can result in settlement, slope instability, erosion, and foundation/structural failure. These potential impacts are described based on review of the 2004 FEIS/EIR and several geotechnical studies that were completed for the Downtown Rail Extension (DTX) since the 2004 FEIS/EIS was certified (particularly, ARUP 2010 and Parsons Transportation Group 2010a and 2010b). The current analysis focuses on the proposed project component locations and whether conditions have changed since approval of the 2004 FEIS/EIR.

3.9.2 Affected Environment

Faults

Fault Rupture

The proposed project area is located on the northeast part of the San Francisco Peninsula within the greater California Coast Ranges geomorphic province. This tectonically active region is marked by generally northwest-trending features such as the northern Santa Cruz Mountains, the submerged San Francisco Bay Valley, and the San Andreas Fault system (Figure 3.9-1). Faults identified closest to the proposed project area are the San Andreas Fault (within 8 miles), the Hayward Fault (within 9 miles), and the San Gregorio Fault (within 11 miles). Other major active faults in the region include the Calaveras, Concord-Green Valley, Greenville, and Rodgers Creek Faults. Potential impacts due to seismic activity include fault rupture, groundshaking, liquefaction, lateral spreading, and earthquake-induced spreading.

Fault rupture typically follows along pre-existing fault lines, with surface ruptures happening when fault movement breaks through the ground surface. A low potential exists for such impacts to occur in the vicinity of the proposed project because the project area is not located in an Alquist-Priolo Earthquake Fault Zone (state-designated and mapped zones of active and potentially active faults), and no active or potentially active faults are known to be present in the immediate vicinity (City of San Francisco 2012).

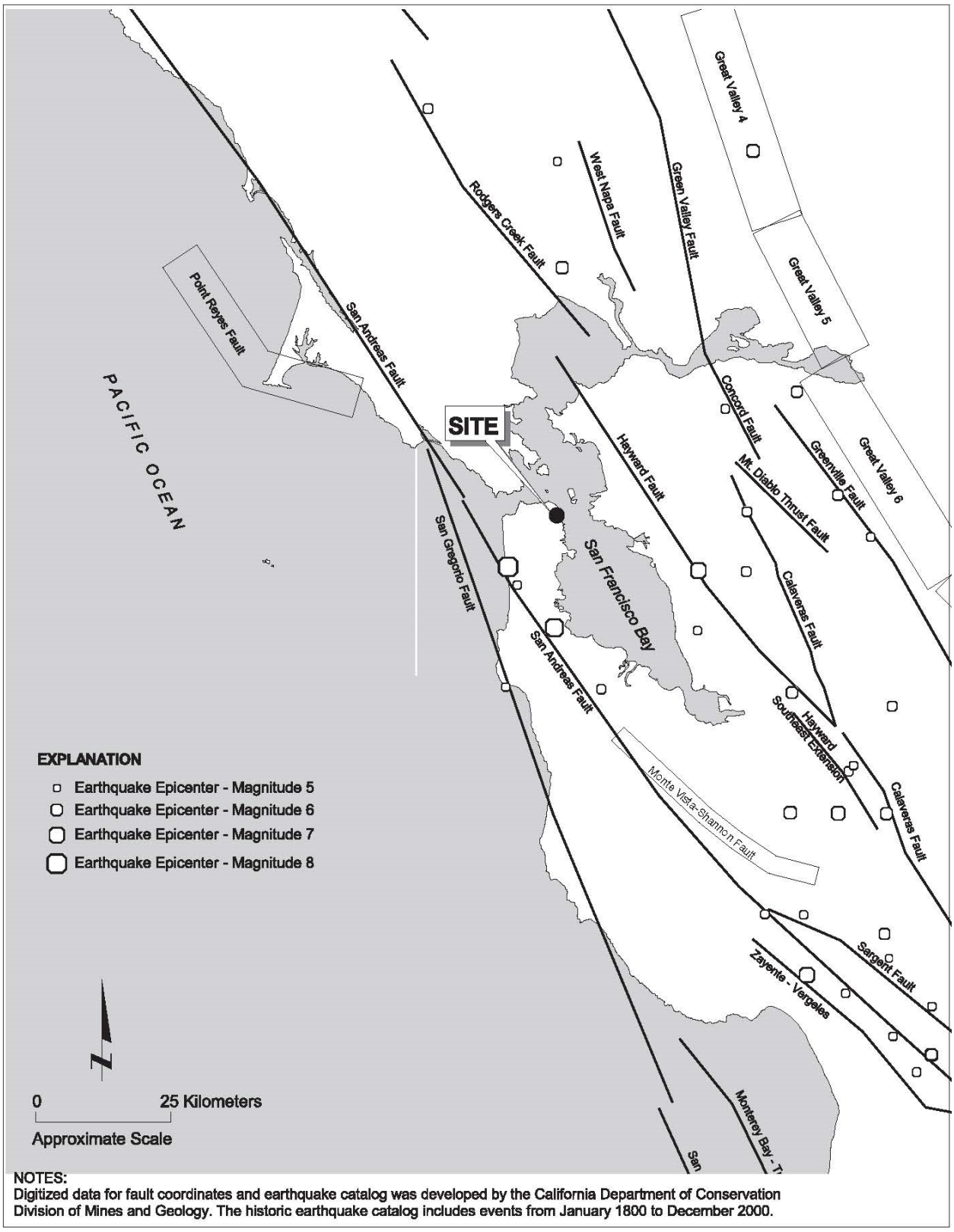
Groundshaking

According to the Working Group on California Earthquake Probabilities (Field et al. 2008), the Hayward-Rodgers Creek and San Andreas Fault systems have the highest probabilities of generating a minimum moment magnitude 6.7 earthquake over a 30-year period, accounting for a 52 percent probability of occurrence.[1] A large earthquake on the Hayward Fault, comparable to the minimum moment magnitude 6.9 during the 1868 earthquake, would generate severe groundshaking (Modified Mercalli Intensity Level of VIII) along the bayshore, and a large earthquake on the San Andreas Fault would generate at least severe groundshaking across most of the City (Boatwright and Bundock 2005).

In its soil types and shaking amplification model, the USGS describes five surficial rock units/soil types[2] based on their potential to amplify the effects of an earthquake. Surficial units classified as "A" result in

[1] The **moment magnitude scale** is used to measure the size of earthquakes in terms of the energy released. The magnitude is based on the seismic moment of the earthquake, which is equal to the rigidity of the Earth multiplied by the average amount of slip on the fault and the size of the area that slipped. The scale was developed in the 1970s to succeed the commonly used and familiar 1930s-era Richter scale.

[2] The USGS has adapted the five soil types defined by the National Earthquake Hazards Reduction Program (NEHRP) to be more specific to the San Francisco Bay Area. Information can be found at http://earthquake.usgs.gov/regional/nca/soiltype/ (accessed January 29, 2014).



Source: Treadwell & Rollo 2008

Figure 3.9-1 Regional Faults

the least amount of amplification, while those classified as "E" result in greatest amount of groundshaking. This amplification is measured by shear wave velocity; shaking is stronger where the shear wave velocity is lower. Figure 3.9-2 shows the potential severity of groundshaking in the proposed project area, using the classification system of the U.S. Geological Survey (USGS). The shear wave velocity is least (highest amplification rating of E) in the vicinity of the eastern end of the Transit Center and the Caltrain railyard. The majority of the DTX alignment traverses rock units/soil types that exhibit an amplification rating of D.

Groundwater

Review of available data regarding historic highest groundwater levels within the City was performed for this SEIS/EIR (Aetypic 2014). In the project area, the historically highest groundwater level was recorded to be between 0 and 30 feet below ground surface. These depths are expected to decrease as sea-level increases of 16 inches are projected over the next 40 years (BCDC 2013). During major earthquakes in areas where groundwater levels are relatively high, saturated sediments that overlie the bedrock units temporarily lose shear strength and their ability to support loads, such as buildings, roads, and other structures. Areas most susceptible to this phenomenon are those characterized by saturated sand, silty sands, unconsolidated silts, and gravels. Where groundwater levels are high, proposed project-related excavations or tunneling activities may encounter groundwater that will need to be removed from the construction area.

Project Area Geology

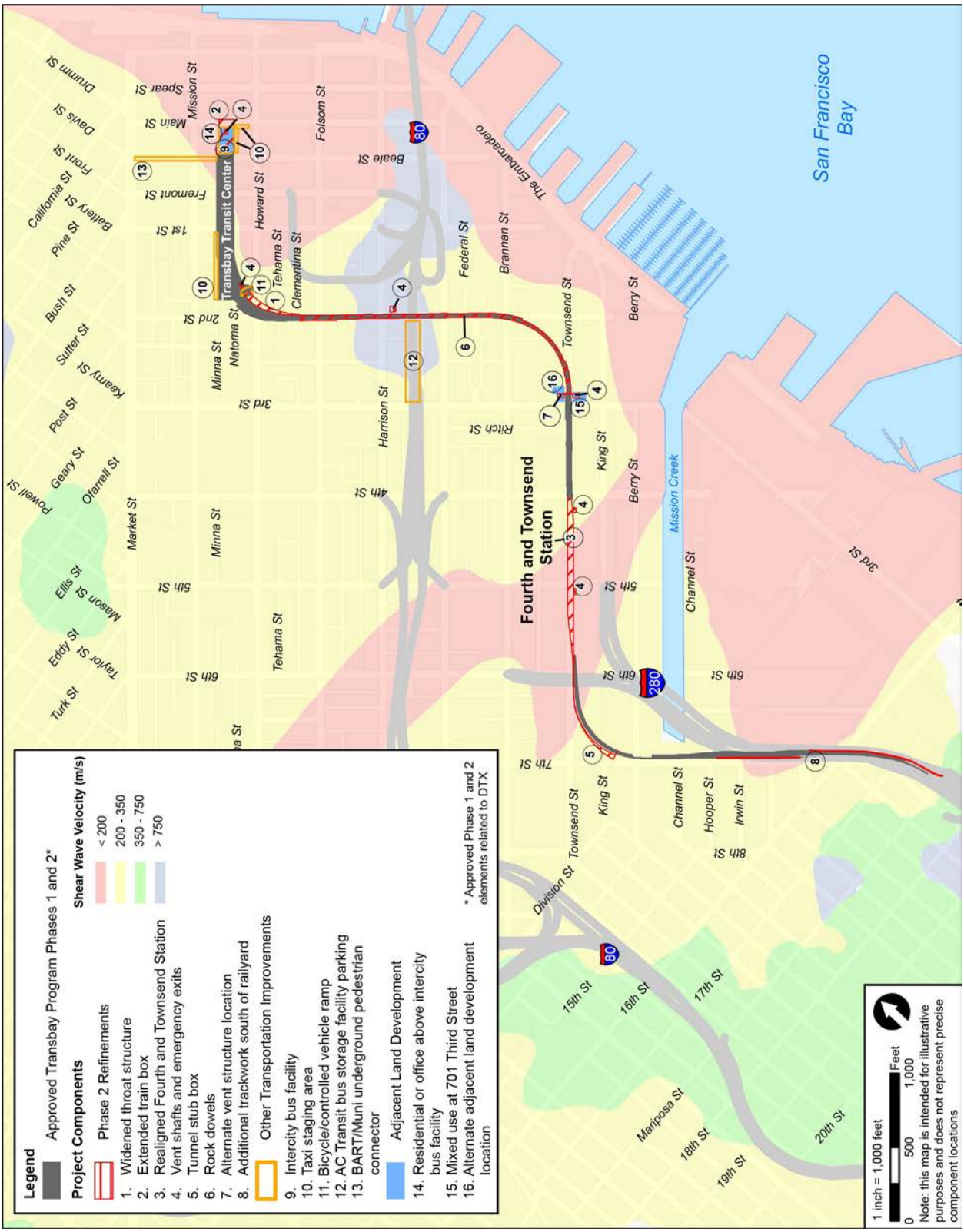
Bedrock

The geologic map of the City shows the common bedrock units in San Francisco to be the Jurassic-age Franciscan Complex volcanic rocks (Jfv), Jurassic-age Great Valley Complex serpentinite (Jsp), Early Cretaceous to Late Jurassic-age Franciscan Complex metamorphic and volcanic rocks (KJfm and KJfv), Early Cretaceous to Late Jurassic-age Franciscan Complex chert (Kfjc), Franciscan complex sedimentary rocks (KJfs and Kfs), and typically Late Cretaceous-age Franciscan Complex mélange. The type of bedrock in the proposed project area is considered as Franciscan Complex (Kfs), which includes fine-to-coarse grained sandstone, with interbedded siltstone and shale.[4] In the proposed project area, shallow bedrock occurs in the area of the vent structure at Third and Townsend Streets, the vent structure at Second and Harrison Streets, the Alameda–Contra Costa (AC) Transit bus storage facility parking, and the rock dowels used with the tunnel segment (as shown in Figure 3.9-3). In most areas of the proposed project, hundreds of feet of sedimentation have covered and overlie the Franciscan Complex bedrock. The oldest overlying layer is the Colma Formation, which is a non-uniform formation of mostly sand, with lesser amounts of gravel, silt, and clay. Younger native materials/deposits include alluvium and alluvium fan deposits, bay deposits, and dune sand.

Surficial Deposits

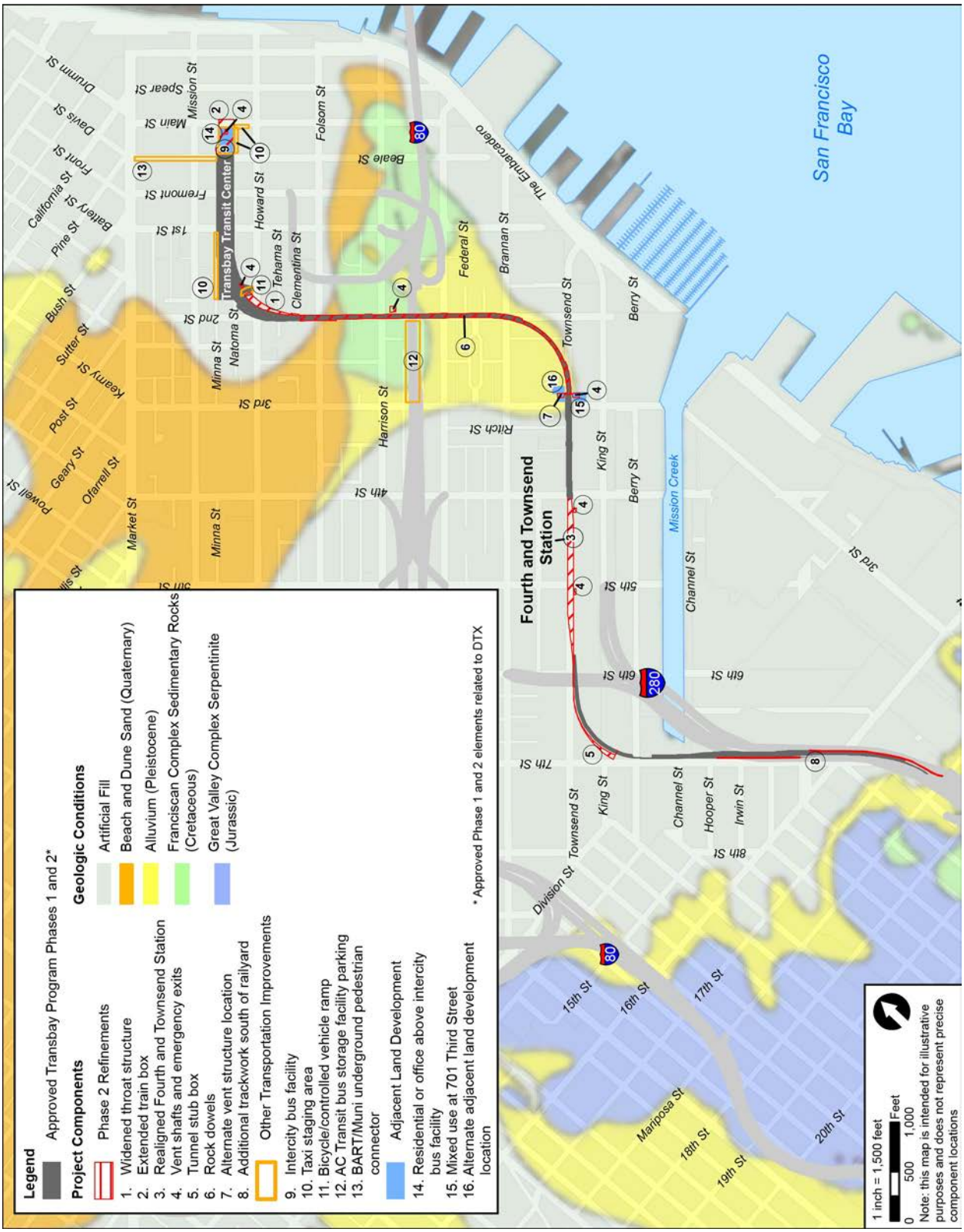
Surficial geologic deposits that occur in the proposed project area are shown in Figure 3.9-3. These deposits have varying groundshaking characteristics during a seismic event and pose different complications for construction. The geologic units in the project area are as follows:

Artificial Fill has been periodically dumped in the vicinity since the nineteenth century in an effort to reclaim Yerba Buena Cove and the San Francisco Bay. The artificial fill is composed of dune sand with varying amounts of building rubble and silt. This is the most common geologic unit along the DTX alignment, covering the additional trackwork south of the Caltrain railyard, Caltrain railyard, the Townsend Street segment, and the Transit Center. Prior to filling, the bay shoreline consisted of a series of small inlets and marshlands separated by bedrock peninsulas, but after filling, relatively level ground



Sources: Aetypic 2014; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.9-2 Shear Wave Velocities



Sources: Aetypic 2014; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.9-3 Surficial Geologic Deposits

was created between the coastal bluffs and hills, sometimes retained by seawalls and various sheet piles. A majority of this fill was non-engineered, particularly fill that was placed prior to 1965. Typically, fill was placed directly over Young Bay Mud or on top of wood piles sunk into the mud. For this reason, and due to the inconsistent nature of placement, the uniformity and density of fill throughout the project area is highly variable. Where historically high groundwater exists, a substantial hazard for liquefaction exists in the event of an earthquake. Artificial fill deposited in the late nineteenth century for land reclamation purpose is found in the vicinity of the realigned Fourth and Townsend Street Station, the vent structures at Fourth and Townsend Streets and at Third and Townsend Streets, the tunnel stub box, and along most of the tunnel area where rock dowels would be used.

- **Bay Mud.** Although not shown in Figure 3.9-3 as a surficial geologic unit, bay deposits are important to understanding geoseismic conditions and potential risks. These deposits occur in still waters around the San Francisco Bay and extend inland in the proposed project area, following the earlier shoreline along San Francisco Bay. Bay deposits are often covered by artificial fill and overlie older alluvium deposits and rock; they are classified as Old Bay Mud and Young Bay Mud. The latter is soft or very soft and organically rich, and often contains numerous clam shells. Former marshland/bay deposits overlain by artificial fill characterize the area around the widened throat structure and the vent structure at Second and Natoma Streets. Artificial fill deposited atop Bay Mud is common around the majority of the remaining proposed project components located between Beale and Main Streets (from Howard to Market Streets), east of the former (1848) westernmost San Francisco Bay shoreline.

- **Dune Sand** is a fine- to medium-grained sand that often underlies the artificial fill described above. Dune sand covers nearly half of San Francisco and occurs in the eastern and western portions of the proposed project area, but is only minimally encountered along the DTX alignment.

- **Alluvium and Alluvial Fans** include sand, gravel, silt, and clay deposits, most of which have been modified by grading and paved over.

Stratigraphy

Stratigraphy refers to layers of rock and geologic deposits, focusing primarily on the distribution, deposition, and age of sedimentary rocks. Because many of the proposed project components involve below-ground facilities and construction, an overview to the various layers underlying the surface deposits described above is instructive.

The particular stratigraphic layer and depth to groundwater for each of the proposed project components are described below. Most of the below-ground project components would be below the surficial artificial fill layer.

Widened Throat Structure. The widened throat structure area would be located west of the 1848 shoreline where fill was placed over Bay deposit. The area contains between 10 and 30 feet of fill, underlain by a slight layer of Young Bay Mud (between 0 and 10 feet) with a subsequent layer of medium dense sand or Bay Mud. Finally, a layer of sand (10 to 20 feet thick) is positioned above bedrock (60 to 200 feet below ground surface). Historically, the highest groundwater is reported to be 10 feet below ground surface, and excavation is proposed to 65 feet in depth.

Extended Train Box. This proposed project component would be located east of the 1848 shoreline where fill was placed to extend the shoreline to its current location. The subsurface strata of the extended train box are marked in the upper levels by 10 to 20 feet of fill composed of both dune sand and

construction debris. The next layer is composed of 30 to 50 feet of Young Bay Mud, followed by 50 to 60 feet of medium dense to dense sand. Bedrock would be encountered at 120 feet below ground surface or greater. Historically, the highest groundwater is reported to be less than 5 feet below ground surface, and the proposed excavation depth is 45 feet.

Realigned Fourth and Townsend Street Station. This proposed project component would be located above 10 to 20 feet of fill. Subsequent layers include Young Bay Mud (10 to 15 feet thick), with bedrock encountered at approximately 60 feet below ground surface. The depth to historically highest groundwater is less than 5 feet below surface. Excavation in this area is anticipated to reach 50 feet.

Vent Structures at Fourth and Townsend Streets and Fifth and Townsend Streets. These proposed project components are proposed above the realigned Fourth and Townsend Street Station, and therefore share the same subsurface conditions. Refer to the Fourth and Townsend Street Station setting, above. Excavation is anticipated to reach 50 feet.

Vent Structure at Third and Townsend Streets. This proposed project component (both the preferred location and the alternate location) would be located above 0 to 10 feet of fill. The depth to historically highest groundwater is 5 to 10 feet below surface, and excavation in this area is anticipated to reach 70 feet.

Vent Structure at Second and Harrison Streets. This proposed project component would be located above 0 to 5 feet of fill and in a shallow bedrock area. Bedrock would be encountered at less than 20 feet below ground surface. The depth to historically highest groundwater is approximately 5 to 10 feet below surface, and excavation is expected to reach a depth of 100 feet.

Vent Structure at Second and Natoma Streets. This proposed project component would be constructed in the vicinity of the widened throat structure; therefore, this area is similar in composition (discussed above). The depth to historically highest groundwater is approximately 10 feet below surface, with bedrock encountered at 180 feet. Excavation would reach an approximate 70 feet in depth.

Vent Structure at Natoma and Main Streets. This proposed project component would be constructed near the east end of the extended train box; therefore, this area is similar in composition to what is discussed above. The depth to historically highest groundwater is approximately 5 feet below surface, with bedrock encountered at greater than 120 feet; excavation is anticipated to reach 45 feet in depth.

Tunnel Stub Box. The subsurface strata of the tunnel stub box are marked in the upper levels by approximately 20 feet of fill. The next layer is approximately 20 feet of Young Bay Mud, followed by approximately 70 feet of sand. Excavation in this area is anticipated to reach 70 feet in depth.

Rock Dowels. This proposed project component would be installed as part of the tunnel construction, generally from Third and Townsend Streets, along Townsend Street, and north along Second Street to just pass Folsom Street. Virtually all of this segment of the DTX would pass through Franciscan bedrock with overlying layers of artificial fill, Colma sand, and residual soils; the depths of these layers vary considerably along the alignment. Excavation in this area would be approximately 75 to 90 feet below the ground surface.

Additional Trackwork South of the Caltrain Railyard. This proposed project component would be within existing Caltrain right-of-way and the new tracks would be installed at-grade. Minimal grading is proposed for this component, which overlies artificial fill.

Intercity Bus Facility. The intercity bus facility is proposed above the extended train box, and, therefore, shares the same subsurface conditions. Refer to the extended train box setting, above. No excavation is proposed for this component.

Taxi Staging Area. This proposed project component would be in the vicinity of the widened throat structure and the intercity bus facility. The subsurface composition of the taxi staging area is, thus, similar to these other proposed project components (discussed above). No excavation is proposed for this component.

Bicycle/Controlled Vehicle Ramp and Below-Grade Bicycle Facilities. The bicycle/controlled vehicle ramp would be located west of the 1848 shoreline, where fill was placed over dune sand. This proposed project component would be positioned above 20 to 30 feet of fill. Underlying this upper layer is Young Bay Mud (0 to 10 feet), sand (50 to 60 feet thick), Old Bay Mud (60 to 80 feet thick), and lower sand (10 to 20 feet thick), with bedrock encountered at 200 to 250 feet below ground surface. Historically, the highest groundwater depth is approximately 10 feet below surface, and excavation is proposed to approximately 50 feet in depth.

AC Transit Bus Storage Facility Parking. Beneath this proposed project component lies approximately 10 to 20 feet of fill and dune sand before encountering shallow bedrock. No excavation is proposed for this component.

BART/Muni Underground Pedestrian Connector. The subsurface composition of the BART/Muni underground pedestrian connector is characterized by fill just below the pavement. The fill is composed primarily of medium-dense sand intermixed with silt. Dune sand with concrete and brick fragments is also present in the fill layer. This is followed by a gravel layer at a depth between 10 and 30 feet overlying Bay sand composed of very loose to medium dense and poorly graded sand. The depth to historically highest groundwater is approximately 5 to 10 feet below surface, with bedrock encountered at greater than 100 feet. Excavation depth is estimated to be a maximum of 30 feet at this proposed project component's southern end at Mission Street.

Adjacent Land Development. The adjacent land development sites are located at the proposed intercity bus facility and the vent structure at Third and Townsend Streets, and, therefore, have similar subsurface setting conditions to the transportation-related facilities with which they would be co-located. Refer to the intercity bus facility and vent structure descriptions, above, for subsurface conditions at the adjacent land development sites.

Landslides

The proposed project area is entirely developed, with little exposed soil on steep slopes that would be susceptible to a landslide. The nearest areas with any landslide potential are approximately 2 miles northwest in the vicinity of Coit Tower, and approximately 1.5 miles to the south along Pennsylvania Avenue at Nineteenth Street (Aetypic 2014).

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning geology, soils, and seismicity, including new guidance issued since the 2004 FEIS/EIR.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on geology, soils, and seismicity, and to avoid or mitigate those impacts when feasible.

2013 California Building Code

The California Building Code (CBC) contains the minimum standards for design and construction in California. Included within this code are standards associated with seismic engineering, soil limitations, geotechnical hazards, slope stability hazards, and foundation designs detailed in the Uniform Building Code. Local standards other than the CBC may be adopted if such standards are stricter. The 2013 edition of the CBC became effective on January 1, 2014.

California Public Resources Code Chapter 7.8, 1990 Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 allows the lead agency to withhold permits until geologic investigations are conducted and mitigation measures are incorporated into plans. The Seismic Hazards Mapping Act addresses not only seismically induced hazards, but also expansive soils, settlement, and slope stability.

Local

San Francisco Building Code

The City has adopted the San Francisco Building Code, which incorporates the California Building Code, the California Residential Code, the California Green Building Standards Code, and San Francisco-specific amendments. The City Department of Building Inspection is responsible for permit application review, inspections, and code enforcement.

3.9.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- Expose people or structures to potential adverse effects, including loss, injury, or death involving any of the following:
  - 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);
  - strong seismic groundshaking; or
  - seismic-related ground failure, including liquefaction.
- Result in substantial soil erosion or the loss of topsoil.
- Be located on a 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.

- Be located in expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property.

- 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.

Issues Not Addressed Further in this SEIS/EIR

Fault Rupture. The 2004 FEIS/EIR noted that no known faults exist that would cross the alignment; that discussion in Section 4.8 Geology and Seismicity (pages 4-35 to page 4-39) is incorporated by reference in this SEIS/EIR. Fault rupture would not be a relevant impact in the proposed project area, and it is not discussed further herein.

Septic Tanks and/or Alternative Wastewater Disposal Systems. No septic tanks or alternative wastewater disposal systems were proposed in the Transbay Program; therefore, the 2004 FEIS/EIR did not address septic tanks and/or alternative wastewater disposal systems. Septic tanks and/or other on-site land-disposal systems are not proposed for any proposed project component, and all wastewater conveyance and treatment are handled by the City's combined sewer/storm water system. Therefore, this issue is not discussed further in this SEIS/EIR.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the geologic and seismic effects will be the same as those presented in Section 5.9 Geology and Seismicity (pages 5-78 to 5-80) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects, plus Mitigation Measures SG 1, SG 2, SG 3, SG 4, and SG 5, which were previously identified in the 2004 FEIS/EIR and were adopted and incorporated into the approved Transbay Program, is provided below. The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR.

Seismically Induced Hazards. Seismically induced groundshaking can be expected to result in subsidence and lateral spreading due to liquefaction of saturated soils. Portions of the Transbay Program overlie Bay Mud, which is a primary contributing factor to ground-motion amplification during earthquakes. Bay Mud extends to depths of almost 100 feet below the ground surface along portions of the Transbay Program area; therefore, these areas (particularly the DTX segment between Folsom Street and the Transit Center) will be most susceptible to amplified ground motion. Mitigation measures to prevent the geoseismic hazards identified in the 2004 FEIS/EIR rely on the application of geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels throughout the downtown area. To mitigate for seismic events and groundshaking, structural components will be designed and constructed to resist strong ground motions approximating the defined maximum anticipated earthquake. The 2004 FEIS/EIR concluded that seismically induced hazards will have a no adverse effect/less-than-significant impact with implementation of mitigation measures. Mitigation Measures SG 2 and SG 3, summarized below, were identified in the 2004 FEIS/EIR to reduce significant groundshaking impacts. The full text for the mitigation measures is contained in Appendix C of this SEIS/EIR.

- **SG 2** – apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels.

- **SG 3** – design and construct structural components to resist strong ground motions approximating the defined maximum anticipated earthquake.

Ground Stability. Fill soils, as shown in Figure 3.9-3, possess adverse characteristics such as rubble, heterogeneity of composition and depth, and locally high permeability. These characteristics can result in ground deformations where Transbay Program facilities are proposed. Areas of Bay Mud overlain by artificial fill will also be susceptible to differential settlement, and could affect the stability of the tunnel face and the degree of ground deformation. Mitigation measures identified in the 2004 FEIS/EIR to prevent potential settlement rely on the application of proper design and construction of pile-supported foundations to minimize non-seismic settlement in areas susceptible to potential settlement (e.g., soft compressible sediments like Bay Mud). The 2004 FEIS/EIR concluded that potential settlement will have a no adverse effect/less-than-significant impact with implementation of the mitigation measures. Mitigation Measures SG 3 and SG 5, summarized below, were identified in the 2004 FEIS/EIR to reduce significant ground stability impacts. The full text for the mitigation measures is contained in Appendix C of this SEIS/EIR.

- **SG 3** – design and construct structural components to resist strong ground motions approximating the defined maximum anticipated earthquake.

- **SG 5** – design and construct pile-supported foundations to minimize non-seismic settlement in areas susceptible to potential settlement.

Construction. The adverse characteristics of fill soils could affect the stability of excavations and can result in ground deformations near construction activities. Areas of Bay Mud overlain by artificial fill will also be susceptible to differential settlement, and could affect the stability of excavations. Because of the proximity to structures where construction activities are proposed, a key mitigation measure during construction is monitoring adjacent buildings for movement and, if movement is detected, immediate actions to control the movement. The application of geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels throughout the downtown area is required (Mitigation Measure SG-2) for the project. Where determined to be appropriate, the TJPA will underpin existing buildings to protect the structures from potential damage that could result from excessive ground movements during construction (Mitigation Measure SG 4). The stability of excavations will be controlled within tolerable limits by proper design and implementation of excavation shoring systems (Mitigation Measure SG 5). The 2004 FEIS/EIR concluded that seismic hazards and ground stability during construction will have no adverse effects/less-than-significant impacts with implementation of the mitigation measures. Mitigation Measures SG 1, SG 2, SG 4, and SG 5, summarized below, were identified in the 2004 FEIS/EIR to reduce significant construction-related geology and soils impacts. The full text for the measures is contained in Appendix C of this SEIS/EIR.

- **SG 1** – monitor adjacent buildings for movement and, if movement is detected, immediate actions to control the movement would be needed.

- **SG 2** – apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels.

- **SG 4** – underpin existing buildings to protect the structures from potential damage that could result from excessive ground movements during construction.

- **SG 5** – design and construct pile-supported foundations to minimize non-seismic settlement in areas susceptible to potential settlement.

Proposed Project

Because the proposed project components consist of Phase 2 refinements, other transportation improvements, and land development at or adjacent to other elements of the Transbay Program, the 2004 FEIS/EIR addresses nearly all of the geologic, seismic, and soil hazards and impacts of the proposed project. The assessment below is, therefore, substantially similar to the 2004 FEIS/EIR, although more current information and technical analyses have been incorporated to refine potential geoseismic impacts for the proposed project component sites. Mitigation Measures SG 1, SG 2, SG 3, SG 4, and SG 5, which were previously identified in the 2004 FEIS/EIR for the Transbay Program and have been adopted and incorporated into the project, will continue to apply to the geologic, seismic, and soil impacts identified for the proposed project. The full text of these measures is reproduced in Appendix C.

Impact GE-1: The proposed project would not expose people or structures to strong seismic groundshaking during a major earthquake. (No Adverse Effect/Less-than-Significant Impact)

Multiple faults are located in relative proximity to the proposed project, and proposed project components could experience possibly violent groundshaking in the event of a major earthquake. The geologic units comprising the proposed project area have been rated in terms of their amplification of ground motion during an earthquake. This amplification is determined based on the predicted shear wave velocity as follows: the lower the velocity, the higher the amplification. The rating system reflects the USGS model, tailored to the specifics of the proposed project area's soils based on a review of boring data (see Table 3.9-1).

Table 3.9-1
Predicted Groundshaking Levels at Proposed Project Component Sites

Magnitude of Shaking (site class, from least to greatest shaking)	Shear Wave Velocity (meters per second)	Affected Proposed Project Component
A, B	<750	AC Transit bus storage facility parking, vent shaft at Second and Harrison Streets, rock dowels
C	350–750	None
D	200–350	Widened throat structure, bicycle/controlled vehicle ramp, taxi staging area, BART/Muni underground pedestrian connector, vent structures at Third and Townsend Streets and Second and Natoma Streets, additional trackwork south of the Caltrain railyard, AC Transit bus storage facility parking, tunnel stub box, rock dowels
E	<200	Extended train box, realigned Fourth and Townsend Street Station; vent structures at Fourth and Townsend Streets, Fifth and Townsend Streets, and Natoma and Main Streets; additional trackwork south of the Caltrain railyard; intercity bus facility; and BART/Muni underground pedestrian connector

Source: Compiled by Aetypic in 2013

Figure 3.9-2 shows the predicted shear wave velocities in the proposed project area. Areas shown in pink (Site Class E) indicate the greatest amplification and the areas likely to experience the greatest groundshaking. These areas, not unexpectedly, generally coincide with the area east of the 1848 shoreline where fill was deposited over Bay Mud, a soft and compressible deposit. Areas in blue (Site Classes A and B) indicate the least amplification. These areas are associated with bedrock and stiffer soils. Effects for the proposed project are summarized below.

Horizontal accelerations during seismic events also have the effect of momentarily increasing lateral pressure on below-ground walls. A moderate risk of damage to proposed project structures would occur if they are not designed for such stresses.

Due to the complexity and variability of the terrain and subsurface conditions that would be traversed by the DTX and in the vicinity of the proposed project components, the TJPA has completed a number of geotechnical studies. The analyses contained the following considerations that specifically address groundshaking impacts:

- preliminary seismic design criteria and evaluation of liquefaction potential, seismically induced settlements, and potential for lateral spreading, and
- recommendations for geotechnical parameters for the design of permanent structures, including lateral earth and water pressure criteria, resistance to uplift pressures, foundation support, and estimates of potential settlements.

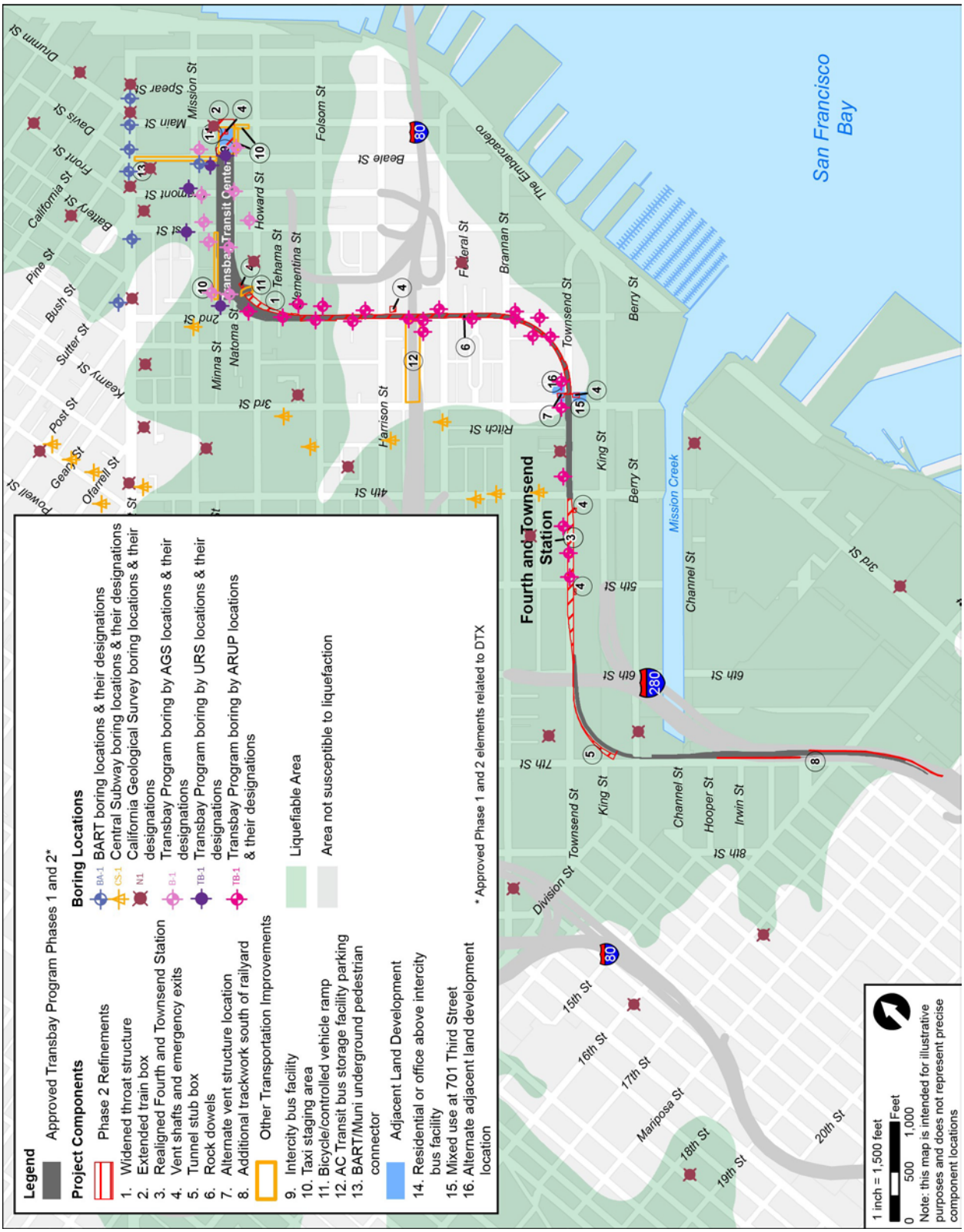
Potential impacts from groundshaking would be considered less than significant because all structural components would be designed and built in compliance with the prevailing building codes and standards (such as the CBC and American Society of Civil Engineers [ASCE] 7, the latter being a set of technical manuals for design loads for buildings and other structures). Mitigation Measures SG 2 and SG 3, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, will continue to apply and would be implemented for the proposed project. Also, designers and builders would comply with the TJPA DTX Design Criteria, which includes specific chapters on seismic design and structural design.

Impact GE-2: The proposed project would not expose people or structures to seismic-related ground failure, including liquefaction. (No Adverse Effect/Less-than-Significant Impact)

Ground failure associated with liquefaction, lateral spreading, and earthquake-induced spreading are possible results of earthquake-induced settlement. Based on the soil profile, approximately 6 to 12 inches of settlement and liquefaction throughout the project area may occur during a major earthquake.

Liquefaction. Soil liquefaction is a phenomenon in which soils lose their strength and cohesion when saturated with water, which can occur during earthquakes. In the process, the soil becomes sufficiently unstable and permits horizontal and vertical movements if not confined. Soils most susceptible to liquefaction are loose, clean, uniformly graded fine-grained sands. Silty and clayey sands may also liquefy during strong groundshaking. Structures founded on liquefiable zones may experience temporary loss of bearing capacity (i.e., the ability to support a load such as a structure), resulting in moderate to severe damage. In contrast, those structures founded below the liquefiable zone would not experience bearing capacity failure.

Assuming a Magnitude 7.9 earthquake, peak ground accelerations that correspond to the 84th percentile, and groundwater depths from historic and recent logs (and reported for each proposed project component earlier in Section 3.9.2, Affected Environment), liquefiable areas were defined. As shown in Figure 3.9-4, the following proposed project components would be susceptible to settlement; deformation; and, in the worst case, failure as a result of liquefaction: widened throat structure, extended train box, realigned Fourth and Townsend Street Station, vent structures at Third and Townsend Streets and at the Fourth and Townsend Street Station, tunnel stub box, additional trackwork south of the Caltrain railyard, intercity bus facility, taxi staging area, bicycle/controlled vehicle ramp, BART/Muni underground pedestrian connector, and the adjacent land development at the intercity bus facility and vent structure at Third and Townsend Streets. Only the vent structure at Second and Harrison Streets and the AC Transit bus storage facility parking would not be anticipated to experience liquefaction impacts.



Sources: Aetypic 2014; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.9-4 Liquefiable Areas with Boring Locations

Potential seismically induced settlement varies widely across the proposed project area, with proposed project components estimated to experience up to 40 inches of settlement and proposed project components near the Caltrain railyard estimated to experience up to 10 inches of seismic settlement (Aetypic 2014). Figure 3.9-5 shows the predicted seismically induced settlement.

Settlement and Lateral Spreading. Earthquake-induced settlement can occur because of the rapid compaction, rearrangement, and settlement of subsurface materials. Dune sand, marsh deposits, Bay mud, and artificial fill are all susceptible to settlement, and the degree of these impacts are much the same as under liquefaction as described above. Lateral spreading occurs when large blocks of intact, non-liquefied soils move downslope on a liquefied substrate of large aerial extent. Estimated lateral deformations are projected to be 10 to 20 inches around the Transit Center, affecting the widened throat structure, extended train box, Transit Center vent structures, intercity bus facility (and adjacent land development), taxi staging area, and bicycle/controlled vehicle ramp. Other proposed project components (for example, the Fourth and Townsend Street Station vent structures and the tunnel stub box) may experience 5 to 10 inches of ground deformations. The additional trackwork south of the Caltrain railyard may experience lateral deformation between about 1 and 5 inches. Lateral deformations projected to be less than 1 inch include the vent structure at Second and Harrison Streets (and adjacent land development), rock dowels, and AC Transit bus storage facility. Figure 3.9-6 shows predicted lateral spreading deformation across the project area.

The 2004 FEIS/EIR addressed seismically induced subsidence and lateral spreading of the ground surface as a result of liquefaction of saturated soils, and that analysis is incorporated by reference into this SEIS/EIR. These impacts are summarized above under the discussion of the No Action Alternative. The proposed project would not change the type of construction activities as analyzed in the 2004 FEIS/EIR, but it would involve construction activities at the proposed project component sites that were not previously analyzed. Potential impacts from seismic and non-seismic ground failure would be considered less than significant because all structural components would be designed and built in agreement with prevailing building codes and standards (such as CBC or ASCE 7). Mitigation Measures SG 2, SG 3, and SG 5, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would to apply to the seismically induced and non-seismic ground failure impacts and would be implemented as part of the proposed project. In addition, designers and builders would be required through contractual obligations to comply with the TJPA DTX Design Criteria, which includes specific chapters on geotechnical, seismic, and structural design, and protection of existing buildings.

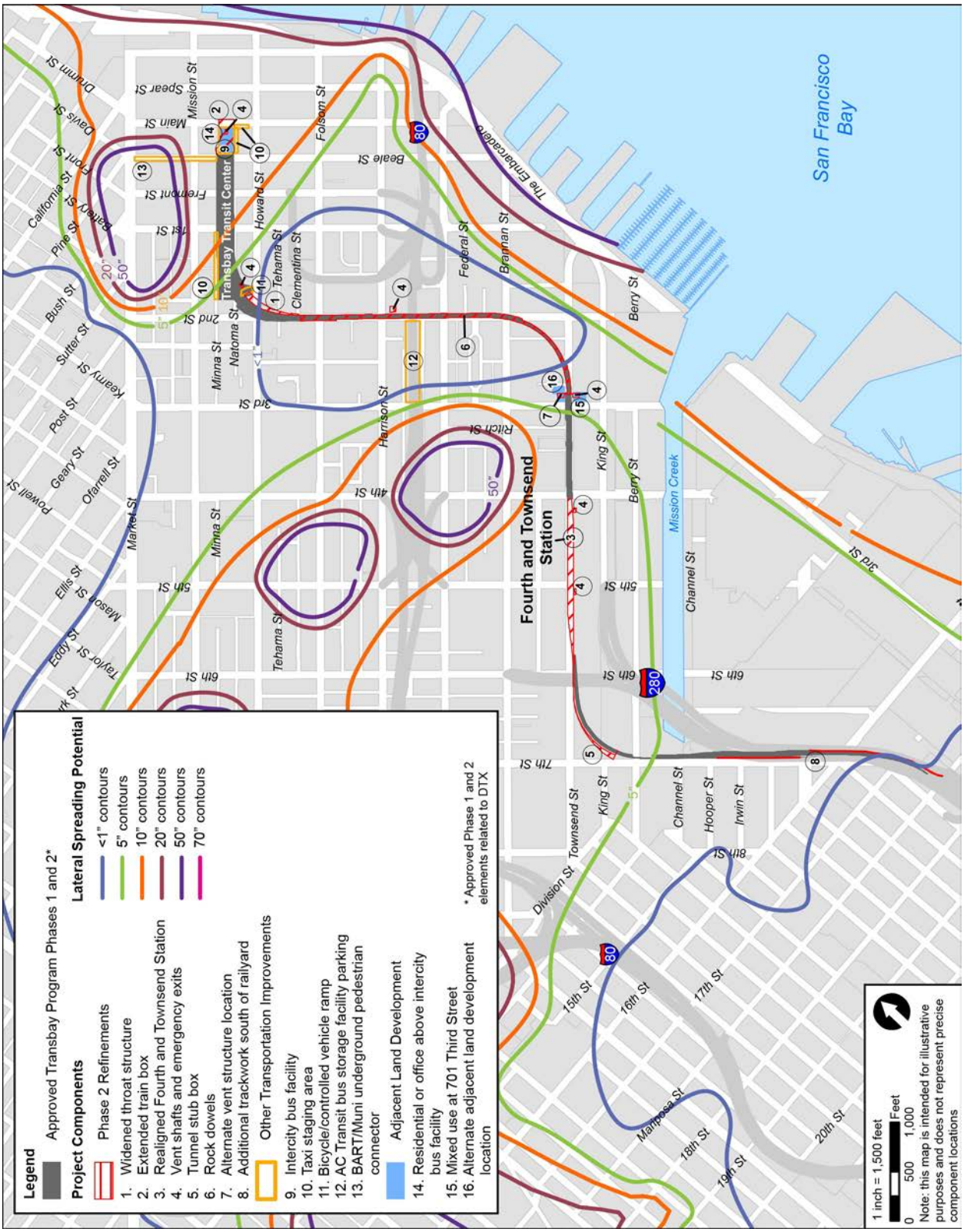
Improvement Measure. Although a no adverse effect/less-than-significant impact is expected related to ground failure, New-I-GE-2.1 would further reduce this less-than-significant impact with techniques to augment the DTX Design Criteria.

New-I-GE-2.1. Augment DTX Design Criteria at the Extended Train Box, Transit Center Vent Structures, and any Above-Ground Structure or Facility. The TJPA shall require the consideration of the following additional measures to reduce the risk of ground failure. The inclusion of these techniques shall be evaluated by the TJPA on a case-by-case basis, considering soil and ground conditions, overhead clearances, subsurface impediments, schedule effects, cost efficiencies, and other factors that the TJPA may deem important.

- Vibro-replacement stone columns: A vibrator could be used to penetrate to the required depth by means of its weight, and vibrations and horizontal vibrations are generated at treatment depth with the use of eccentric weights that are rotated by electric motors; this is effective in reducing the liquefaction potential of sands and low-plasticity silt.

Sources: Aetypic 2014; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.9-5 Seismically Induced Settlement



Sources: Aetypic 2014; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.9-6 Lateral Spreading Potential

- Deep soil mixing: Soil is blended with cementitious and/or other reagent materials through the tips of the auger during auger penetration and removal to form continuous soil-cement columns.
- Grouting techniques (compaction, permeation, deep mixing, chemical, and jet grouting).

The effectiveness and uses of these different techniques are shown in Table 3.9-2. Although the DTX Design Criteria and compliance with applicable codes are expected to reduce potential ground failure impacts from liquefaction to not adverse/less than significant, the techniques in Table 3.9-2 would be adopted to augment the DTX Design Criteria to further reduce this less-than-significant impact.

Table 3.9-2
Summary of Liquefaction Mitigation Techniques

Liquefaction Mitigation Technique		Advantages	Disadvantages	Relative Cost
Vibro-Replacement Stone Column		Effective and economical method in many situations. Able to reach depths unattainable by other methods.	Ineffective for densifying soils with greater than 20% fine contents. The liquefiable soil should have a minimum thickness for this method to be effective. Waste spoils disposal is required.	Moderate
Deep Soil Mixing		Effective and economical method in many different soils. Method induces very low vibrations, which reduces the potential impact on nearby utilities. Reduces off-site disposal problems. High degree of reliability in terms of effectiveness.	Clear overhead, large boring machine and high-capacity batching of grout slurry. Little ability to overcome obstructions encountered below ground level, particularly within a dense network of utilities.	Moderate to High
Grouting	Compaction Grouting	Pinpoint treatment, speed of installation, wide applications range. Can be performed in very tight access and low-headroom conditions. Non-hazardous; no waste spoil disposal. Able to reach depths unattainable by other methods.	Not effective at depths with low confining pressure (less than 15 feet). Ground surface heave due to grout pressure. Very low reinforcing effects of the compaction grout bulbs/columns.	Low to Moderate
	Deep Mixing Grouting	Wide applications range (even with high fine contents). Cost savings over deep foundation designs. Installation methods are customized for the site conditions.	Waste spoils disposal is required. Significant overhead clearance is required. Pinpoint treatment is not applicable. Very low reinforcing effects of the compaction grout columns.	High
	Permeation Grouting	Minimum disturbance of the native soil. Can be performed in very tight access and low-headroom conditions. Pinpoint treatment.	Construction process is complex. Very costly. Limited to clean sands and ineffective in soils with fines.	High
	Chemical Grouting	Minimum disturbance of the native soil. Can be performed in very tight access and low-headroom conditions. Pinpoint treatment.	Construction process is complex. Very costly. Limited to clean sands and ineffective in soils with fines.	High
	Jet Grouting	Nearly all soil types groutable. Most-effective method of direct underpinning of structures and utilities. Safest method of underpinning construction. Ability to work around buried active utilities. Can be performed in limited workspace. Treatment specific to subsurface locations. No harmful vibrations. Much faster than alternative methods.	Soil erodibility plays a major role in predicting geometry, quality, and production. Cohesionless soils are typically more erodible than cohesive soils. Pinpoint treatment is not applicable. Very low reinforcing effects of the compaction grout bulbs/columns.	High

Source: Compiled by Aetypic in 2013

Impact GE-3: The proposed project would be located on expansive soils; however, compliance with design standards and performance specifications would reduce risks to life or property. (No Adverse Effect/Less-than-Significant Impact)

Soils that shrink and swell with changes in moisture content have the potential to damage structures and pavements that are constructed on them. Such soils might exist beneath parts of the proposed vent structure at Second and Harrison Streets and the AC Transit bus storage facility parking, and have the potential for causing differential settlement and pavement cracking.

The TJPA has completed a number of geotechnical studies in response to the complexity and variability of the terrain conditions that would be traversed by the DTX and in the vicinity of the proposed project components. The analyses contained recommendations for geotechnical parameters for the design of permanent structures, including lateral earth and water pressure criteria, resistance to uplift pressures, foundation support, and estimates of potential settlements. Compliance with building codes (the CBC specifically addresses expansive soils and other soils that pose constructability issues) and the DTX Design Criteria would mitigate potential impacts from expansive soils to acceptable engineering standards, and impacts would be considered less than significant.

Improvement Measure. Although the potential impact related to expansive soils would be a no adverse effect/less-than-significant impact, New-I-GE-3.1 would further reduce this less-than-significant impact and augment the DTX Design Criteria.

New-I-GE-3.1 *Address Expansive Soils at the Vent Structure at Second and Harrison Streets and the AC Transit Bus Storage Facility Parking Sites.* The TJPA shall require the consideration of the following additional measures to address expansive soils. The inclusion of these techniques shall be evaluated by the TJPA on a case-by-case basis, considering soil and ground conditions, schedule effects, cost efficiencies, and other factors that the TJPA may deem important.

- Replace expansive soils with non-expansive soils: Expansive soils can be excavated and replaced with non-expansive materials.
- Treat expansive soils: Expansive soils may be treated in place by mixing them with lime or cement. Lime treatment alters the chemical composition of the expansive clay minerals such that the soil becomes non-expansive. Cement treatment also alters the chemical composition of the expansive clay minerals such that the soil becomes non-expansive by forming a lean cement mixture beneath the pavement base.

Impact C-GE-4: During excavation, the proposed project could cause settlement for adjacent properties and create hazards for construction workers and the public, but this potential effect would be reduced by proposed mitigation to address changes to groundwater level. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The proposed project would require difficult excavation associated with the areas with shallow bedrock and shallow groundwater.

Shallow Bedrock. The vent structures at Third and Townsend Streets and Second and Harrison Streets are located in shallow bedrock (depth to the top of bedrock is less than 40 feet). Excavation in areas with shallow bedrock is difficult because of the density of the rock unit. Both of these vent structures would be along the DTX alignment and would be excavated as part of Phase 2 of the Transbay Program.

Shallow Groundwater. If the water level is lowered outside the area of excavation by construction dewatering, consolidation of the poorly consolidated in-situ soils may occur and result in settlement around the excavation zone. Except for the intercity bus facility, the AC Transit bus storage facility parking, and the taxi staging areas, all of the proposed project components would be situated below or near the groundwater table; therefore, construction of these components may require dewatering. Lowering the groundwater table increases the load on foundation soils below the original groundwater table. Because soils in the project area are expected to consolidate upon application of additional load, structures located within the radius of influence of a dewatering system may settle. If the water level is lowered outside the excavation, consolidation may occur that results in settlement-induced damages on adjacent structures.

Excavation Base Stability. Stability of the base of excavations is dependent on the success of the groundwater control system, the strength of soils at the excavation bottom, and the dimensions of the excavation. For excavations deeper than 25 to 30 feet below ground surface into Young Bay Mud, some heaving and base instability may occur. This could occur at the extended train box and Transit Center vent structures sites.

Potential construction impacts from seismic and non-seismic geotechnical hazards would be adverse/potentially significant for excavations deeper than 25 to 30 feet below ground surface into Young Bay Mud, which would result in potential base failure. All structural components would be designed and built in agreement with the prevailing building codes and standards (such as CBC or ASCE 7); Mitigation Measures SG 1, SG 2, SG 4, and SG 5, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the proposed project, would continue to apply and would be implemented. Also, designers and builders would comply with the TJPA DTX Design Criteria, which includes specific chapters on geotechnical, seismic design, structural, and protection of existing buildings.

Mitigation Measure. The proposed project would result in a potentially adverse effect/significant impact related to ground instability from changes to groundwater that was not specifically addressed in the 2004 FEIS/EIR. The following new mitigation measure would reduce the adverse NEPA effect and would reduce the potentially significant CEQA impact to a less-than-significant level.

New-MM-C-GE-4.1 *Dewatering at the Extended Train Box and Transit Center Vent Structures Sites.* Groundwater level shall be maintained a minimum of 2 feet or more beneath the bottom of the excavation throughout construction to minimize the potential of base failure due to high seepage gradients.

Impact C-GE-5: The proposed project would not result in substantial soil erosion or the loss of topsoil. (No Adverse Effect/Less-than-Significant Impact)

As described under Section 3.9.2, Affected Environment, the proposed project component sites are almost entirely paved or developed. Exposed fill, sand, and deposits, would be moderately to highly susceptible to erosion resulting from storm water runoff when exposed during construction-related activities such as excavation. Topsoil and underlying soils at the construction sites would be disturbed during project-related excavation and grading activities. In most cases, the greatest soil erosion hazard would occur during excavation and construction of the project components when the soil is exposed. Construction vehicles and equipment at the proposed project component sites, including haul trucks removing excavated sediments, could entrain sediment on their tires and carry it to surface streets, where it would be deposited and eventually be washed into nearby storm drains. Increased sediment loads in storm drains from construction dewatering and deposition on streets from vehicle tires would also add incrementally to wastewater treatment requirements.

As discussed in Impact WQ-1 in Section 3.8, Water Resources and Water Quality, the proposed project would be required to comply with all water quality standards and waste discharge requirements. This would include preparation of an erosion and sediment control plan (ESCP) and implementing permanent erosion-control best management practices (BMPs), which would control erosion and loss of topsoil. Therefore, compliance with applicable regulations and implementation of the ESCP and BMPs would result in a no adverse effect/less-than-significant impact.

Cumulative Analysis

Impact CU-GE-6: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative impacts on geology and seismicity. (No Adverse Effect/Less-than-Significant Impact)

The cumulative context for geologic and seismic hazards is the City of San Francisco, and encompasses the particular physiographic features that help create these risks to life and property (for the cumulative approach employed, see Section 3.1, Introduction). Reasonably foreseeable projects considered in this analysis have been presented in Table 3.1-1 and Figure 3.1-1.

Proposed project components would be constructed in compliance with the prevailing building codes and standards, and the DTX Design Criteria, which would reduce seismic-related ground failure and expansive soil impacts to the maximum extent possible. Cumulative development and improvements to existing development would be required to undergo analysis of geological and soil conditions applicable to the specific project, and would be subject to building standards and codes that are intended reduce the effects of earthquakes, landslides, seismically induced and non-seismic ground failure, and soils that pose constructability challenges. Both the CBC and the San Francisco Building Code, as administered and enforced by the City Department of Building Inspection, establish standards for construction that are particularly attuned to the seismic activity of the area. Because cumulative projects would each be required to comply with these regulations and standards, cumulative impacts with the proposed project related to geoseismic hazards would be not adverse/less than significant.

Construction activities of the proposed project components would include grading and excavation, which could result in exposed materials susceptible to erosion. Development of the cumulative projects could result in similar erosion impacts during construction from ground-disturbing construction activities. Development throughout the City is subject to runoff, erosion, and sedimentation prevention requirements, including complying with applicable regulations for soil erosion control, the National Pollutant Discharge Elimination System permit process, and implementation of BMPs. Therefore, cumulative geology and soils impacts with the proposed project from construction would be not adverse/less than significant.

3.9.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Geology, Soils, and Seismicity (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that although the potential would exist for geologic, seismic, and soil hazards in the project area, no adverse effect would occur with mitigation. The proposed project analyzed in this SEIS/EIR would result in a new adverse effect not identified in the 2004 FEIS/EIR related to changes to groundwater levels from dewatering during excavation of the extended train box and tunnel stub. However, with implementation of New-MM-C-GE-4.1, in addition to the 2004 FEIS/EIR mitigation measures SG 1 through SG 5 previously adopted and incorporated into the Transbay Program, this adverse effect would be reduced. As a result, the proposed project effects on geology, seismicity, and soils would not be adverse.
CEQA Summary	
Impact GE-1: Seismic Groundshaking (Less than Significant)	The 2004 FEIS/EIR indicated that portions of the project area are underlain by soft sediments that are susceptible to amplified ground motion; however, the 2004 FEIS/EIR concluded that with mitigation, a less-than-significant impact related to seismically induced groundshaking would result. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts related to seismically induced groundshaking. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No additional mitigation measures beyond Mitigation Measures SG 2 and SG 3 identified in the 2004 FEIS/EIR and previously adopted and incorporated into the Transbay Program would be required for the proposed project.
Impact GE-2: Seismic-Related Ground Failure (Less than Significant)	With mitigation, the 2004 FEIS/EIR concluded that a less-than-significant impact would occur related to seismically induced and non-seismic ground failure. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts related to seismically induced and non-seismic ground failure. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No additional mitigation measures beyond Mitigation Measures SG 2, SG 3, and SG 5 identified in the 2004 FEIS/EIR and previously adopted and incorporated into the Transbay Program would be required for the proposed project. New Improvement Measure I-GE-2.1 would further reduce impacts related to ground failure with techniques to augment the DTX Design Criteria.
Impact GE-3: Expansive Soils (Less than Significant)	The 2004 FEIS/EIR did not specifically address expansive soils. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts related to construction on expansive soils. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project. New Improvement Measures I-GE-3.1 would further reduce less-than-significant impacts related to expansive soils.
Impact C-GE-4: Construction – Settlement during Excavation (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that although the potential would exist for settlement in the project area, with mitigation, a less-than-significant impact would occur. The 2004 FEIS/EIR did not specifically address impacts on ground stability from dewatering activities. The proposed project analyzed in this SEIS/EIR would result in a new significant impact not identified in the 2004 FEIS/EIR related to dewatering. With implementation of New Mitigation Measure MM-C-GE-4.1, in addition to mitigation measures previously adopted as part of the 2004 FEIS/EIR and incorporated into the Transbay Program (Mitigation Measures SG 1, SG 2, SG 4, and SG 5), the impact of the proposed project would be less than significant.
Impact C-GE-5: Construction – Soil Erosion (Less than Significant)	The 2004 FEIS/EIR did not specifically address soil erosion or the loss of topsoil. The proposed project analyzed in this SEIS/EIR would result in less-than-significant construction impacts related to soil erosion and loss of topsoil. Therefore, the proposed project would not result in new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.

Impact CU-GE-6: Cumulative – Geology and Seismicity (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would not change the cumulative determination in the 2004 FEIS/EIR. The cumulative impacts on geology and seismicity, with the proposed project, would be less than significant.

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3.10 HAZARDOUS MATERIALS

3.10.1 Introduction

This section describes the potential for hazardous materials and other hazards to affect human health and safety as a result of the proposed project. The evaluation is based on review of the 2004 FEIS/EIR and subsequent addenda, site reconnaissance, review of regulatory agency databases, review of historical aerial photos provided by Environmental Data Resources (EDR), review of fire insurance maps, and review of other published materials related to the proposed project. The analysis focuses on the proposed project component locations and if conditions have changed since approval of the 2004 FEIS/EIR. Please see Section 3.13, Air Quality, for a discussion of construction-related criteria pollutants, ozone precursors, and toxic air contaminants.

Potential hazardous materials issues evaluated in this section are as follows:

- **Existing Hazards** – This issue involves historical and existing land uses and associated hazardous materials releases at the proposed project component sites and surrounding areas that have the potential to create health hazards for construction workers, the public, and/or the environment.

- **Operational Hazards** – This issue concerns the potential health and safety risks related to the use, storage, and/or disposal of hazardous materials associated with the proposed project components. Given the nature of the proposed project (i.e., primarily transportation system improvements related to Caltrain train service and to other transportation system improvements), potential risk from operational hazards focuses on the use of small quantities of diesel stored in above-ground storage tanks to fuel backup generators at the vent structures.

- **Construction Hazards** – This issue involves effects that are related to demolition, soil excavation, and construction of the proposed project components. Two main types of hazardous materials/wastes may cause construction impacts: those used during construction such as fuel, oil, and solvents used for equipment, and those that would be encountered or generated during construction and demolition such as lead, asbestos, gasoline, diesel, and other petroleum hydrocarbons and chemicals. Potential public health and worker's safety impacts from implementation of the proposed project components would include accidental release of hazardous materials used and stored during construction activities or during demolition, and transport and disposal of soil and structures containing hazardous materials.

3.10.2 Affected Environment

Hazardous Materials Sites in the Project Vicinity

The study area is an urban area with a history of commercial, industrial, and residential land uses dating back to before the turn of the 20th century. Urban areas with these types of historic land uses generally have contaminants in the subsurface from disposal, storage, or spillage of hazardous materials. The term "hazardous material" is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.

To determine the potential for hazardous materials within the study area, an EDR search was conducted for each of the proposed project component locations. EDR provided Sanborn Maps and aerial photos for the proposed project locations, spanning a timeline of more than 60 years. EDR also provided information

on sites of "environmental concern" at least one-quarter mile from the proposed project component sites. These sites include leaking underground storage tanks (LUSTs), dry cleaners, gasoline service stations, hazardous materials and waste handling sites, and other facilities with reported leaks or spills. The contaminants of concern would be gasoline, diesel, oil and grease, metals (and associated benzene, toluene, ethyl benzene, and xylenes), possible polychlorinated biphenyls (PCBs), and volatile organics and solvents that could migrate toward the proposed project component sites. The list of hazardous sites of concern was filtered and reduced to include facilities up to approximately 500 feet up-gradient from the proposed project study area. The California Leaking Underground Fuel Tank Historical Analysis (LLNL 1995) determined that petroleum hydrocarbons plume lengths rarely exceed 250 feet. Up-gradient sites were chosen due to the greater possibility of subsurface migration of contaminants from an environmental concern site with a leak or spill toward the proposed project sites. In general, subsurface migration of contaminants follows surface topography.

Table 3.10-1 and Figure 3.10-1 shows the sites that are in the vicinity of (as described above) or within the footprint of the proposed project component sites. The information is organized geographically and combines certain proposed project components that occur within the same general area. Based on the screening process to identify those sites with a potential to affect proposed project components, 36 known hazardous materials sites were identified in the proposed project study area. Of these known hazardous materials sites, nine are located within or sufficiently near the proposed project component sites such that migrating contaminants, if any, could be detected. The majority of these sites are former gas stations and former dry cleaning businesses. The one active business that is a generator of large quantities of hazardous waste is Pacific Gas & Electric at 77 Beale Street, adjacent to the proposed underground pedestrian connector. The listed LUST cases in Table 3.10-1 have been closed, indicating that the regulatory agencies were satisfied with the remediation at those sites and no further action is required.

Hazardous Building Materials

Past industrial land uses in the proposed project area and the nature of the fill material placed during land reclamation have resulted in areas where lead concentrations and other heavy metals in soil exceed state and/or federal criteria for hazardous waste determination (FTA 2004). For example, soil with lead was encountered during the Embarcadero Roadway and Muni Turnaround projects, as well as at recent commercial and residential developments in the South of Market area. Lead is also associated with old underground storage tank sites where leaded gasoline stored in underground storage tanks leaked and affected soil and/or groundwater. Also, lead may be encountered where old rubble and lead-based paint chips have been deposited over the years since the 1906 earthquake.

The proposed project would require demolition of two to four buildings: the podium portion of 201 Mission (built in 1981) and 701 Third Street (originally built in 1922; major renovation in 1997) at the preferred vent structure location; and 699 Third Street (built in 1917) and 180 Townsend Street (built in 1900) at the alternate vent structure site. Two other structures that may be affected by construction are 235 Second Street (built in 2001) and 589 Howard Street (built in 1906). Structures constructed prior to 1981 may contain asbestos, and structures painted prior to 1978 may have lead paint. Also, PCBs were once used as an additive in cooling oils for electrical components. Typical sources of PCBs include electrical transformers. The use of PCBs in electrical transformers manufactured before 1978 was not regulated by the U.S. Environmental Protection Agency (EPA). Based on the age of the buildings proposed for removal, asbestos, lead, mercury, and PCBs could be present.

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning hazardous materials, including new guidance issued since the 2004 FEIS/EIR.

Table 3.10-1
Known Hazardous Materials Sites in the Proposed Project Study Area[1]

Listed # in this Table and Figure 3.10-1	EDR Map ID	Site Name	Site Address	Case Type	Location with Respect to The Project (Direction/ Distance in feet)	Status	Potential Construction-Related Hazard		
							None[2]	Indirect[3]	Direct[4]
Study Area – Widened Throat Structure, Vent Structure at Second and Natoma Streets, and Bicycle/Controlled Vehicle Ramp									
1	C3	Dahl Beck Electric	580 Howard Street	LUST[6]	Within the area	Listed as a LUST. Case is closed.			X
2	D10	Lund PG	601 Howard Street	EDR US Historical Auto Station	Within the area	Known as a former gasoline service station between 1935 and 1971.			X
3	E11	Van and Compagno	141 Second Street	EDR US Historical Cleaners	W/Higher[5] 252 feet	Known as a former or existing dry cleaner.		X	
4	H16	Ampco Parking Lot	171 New Montgomery Street	LUST	SW/Higher 463 feet	Listed as a LUST. Case is closed.		X	
5	H25	Onorato SE Inc.	620 Howard Street	EDR US Historical Auto Station	Within the area	Known as a former gasoline service station in 1958.			X
Study Area – Realigned Fourth and Townsend Street Station (Refer to Fourth and Townsend Station vent structures)									
Study Area – Extended Train Box, Vent Structure at Natoma and Main Streets, and Intercity Bus Facility									
6	A2	Advance Steam Laundry	274 Howard Street	EDR US Historical Cleaners	SE/Higher 217 feet	Known as a former or existing dry cleaner.		X	
7	A17	Paul S Chevron Service Station	199 Beale Street	EDR US Historical Auto Station	SSE/Higher 248 feet	Known as a former gasoline service station in 1935, 1958, and 1966.		X	
8	A19	Johnson EL	300 Howard Street	EDR US Historical Auto Station	SSE/Higher 254 feet	Known as a former gasoline service station in 1935, 1950, 1953, 1962, and 1966.		X	
9	D23 through D27	301 Howard Street	301 Howard Street	CA FID UST;[7] SLIC	S/Higher 404 feet	Operator of an underground storage tank. Leak is being confirmed.		X	
10	D33	Shine Cleaners	216 Beale Street	EDR US Historical Cleaners	SSE/Higher 423 feet	Known as a former or existing dry cleaner.		X	
11	H47	Commercial Property	400 Howard Street	LUST	SSW/Higher 481 feet	Listed as a LUST. Case is closed.		X	

Table 3.10-1
Known Hazardous Materials Sites in the Proposed Project Study Area[1]

Listed # in this Table and Figure 3.10-1	EDR Map ID	Site Name	Site Address	Case Type	Location with Respect to The Project (Direction/ Distance in feet)	Status	Potential Construction-Related Hazard		
							None[2]	Indirect[3]	Direct[4]
Study Area – Fourth and Townsend Street Station Vent Structures									
12	A2	S.P Transportation C	329 Townsend Street	CA LUST	WSW/Lower 183 feet	Listed as a LUST. Case is closed.		X	
13	B8	650 Fourth Street	650 Fourth Street	EDR US Historical Cleaners	NNW/Higher 379 feet	Listed as Fanta Deluxe Cleaner in 2008 and 2009.		X	
14	E13	260 Townsend Street	260 Townsend Street	EDR Historical Auto Station	NE/Higher 449 feet	Former gasoline service station.		X	
15	AC220	JS Gurin Test Trust	510 Townsend Street	CA LUST CORTESE[8]	N/Higher 100 feet	Listed as a LUST. Case is closed.		X	
16	AC247	Flair Electro Sale	516 Townsend Street	CA LUST CORTESE	N/Higher 100 feet	Listed as a LUST. Case is closed. Groundwater impact possible.		X	
17	AQ317	USPS Carrier Annex	550 Townsend Street	CA LUST CORTESE	N/Higher 100 feet	Listed as a LUST. Case is closed. Groundwater impact possible.		X	
Study Area – Vent Structure at 701 Third Street and Alternate Site at 699 Third Street/180 Townsend Street									
18	A1 through A4	Now Auto Center	180 Townsend Street	CA UST	NNE/Higher 76 feet (within the area of the alternate site)	Underground storage tank operator.		X	X
19	A9	Commercial Property	178 Townsend Street	CA LUST	NE/Higher 93 feet	Listed as a LUST. Case is closed.		X	
20	B15	McDonald's Corporation	701 Third Street	HIST CORTESE Former Gas Station	Within the area	Former gasoline service station.			X
21	C22	West Coast Ship Chan	164 Townsend Street	CA LUST	NE/Higher 220 feet	Listed as a LUST. Case is closed.		X	
22	G38	Commercial Property	630 Third Street	CA LUST	WNW/Higher 417 feet	Listed as a LUST. Case is closed.		X	
Study Area – Vent Structure at Second and Harrison Streets									
23	A5	Harris Ren Chevron S	399 Second Street	EDR US Historical Auto Station	NW/Higher 154 feet	Listed as a former gasoline service station between 1962 and 1971.			X

Table 3.10-1
Known Hazardous Materials Sites in the Proposed Project Study Area[1]

Listed # in this Table and Figure 3.10-1	EDR Map ID	Site Name	Site Address	Case Type	Location with Respect to The Project (Direction/ Distance in feet)	Status	Potential Construction-Related Hazard		
							None[2]	Indirect[3]	Direct[4]
Study Area – Tunnel Stub Box									
24	B12	Commercial	370 Townsend Street	EDR Historical Auto Station	N/Higher 200 feet	Listed as a LUST. Case is closed.		X	
25	D24	Cal Train SFP Yard	425 Townsend Street	RCRA-SQG,9 FINDS,10 CA HAZNET11	On-site and within 200 feet	Listed by the EPA as a small-quantity generator of hazardous waste and on EPA databases. Contaminated soil cleanup occurred at this site.			X
Study Area – AC Transit Bus Storage Facility Parking									
26	D9	William Auto Recon	425 Bryant Street	EDR US Historical Auto Station, LUST	ESE/Higher 446 feet	Listed as a former auto repair shop and a LUST with case closure.		X	
Study Area – BART/Muni Underground Pedestrian Connector									
27	A2, B27	50 Beale Street	50 Beale Street	EDR US Historical Cleaners, LUST, Historical CORTESE, Historical UST	WNW/Higher 76 feet	Known as a former or existing dry cleaner. LUST case is closed.			X
28	A4, A5, A7 through A20	77 Beale Street	77 Beale Street	RCRA-LQG,[12] FINDS, Historical UST	SSE/Higher 100 feet	Known as an underground storage tank operator site and generator of large quantity of hazardous waste. Owned by PG&E.			X
29	A6	PG&E PCB Spill Sites	PCB Spill Sites	RCRA-SQG	Unknown Location	Unknown location. Reported spill in 1986. No violations were found.		X	
30	C28, C29, C30	General Office Complex, PG&E	25 Beale Street	CA FID UST SWEEPS UST,[13] Historical UST, UST	NW/Higher 239 feet	Underground storage tank operator.		X	
31	31	La Petite Cleaners	310 Mission Street	EDR US Historical Cleaners	SE/Higher 146 feet	Known as a former or existing dry cleaner.			X

Table 3.10-1
Known Hazardous Materials Sites in the Proposed Project Study Area[1]

Listed # in this Table and Figure 3.10-1	EDR Map ID	Site Name	Site Address	Case Type	Location with Respect to The Project (Direction/ Distance in feet)	Status	Potential Construction-Related Hazard		
							None[2]	Indirect[3]	Direct[4]
32	D32	MC Kale Corporation	350 Mission Street	EDR US Historical Auto Station	WSW/Higher 304 feet	Known as a former gasoline service station in 1958.		X	
33	E37	45 Fremont Building	45 Fremont Street	LUST	WSW/Higher 324 feet	Listed as a LUST. Case is closed.		X	
34	G43	333 Market Street	333 Market Street	LUST	WNW/Higher 354 feet	Listed as a LUST. Case is closed.		X	
35	E52	Shorenstein Property	50 Fremont Street	LUST	SW/Higher 394 feet	Listed as a LUST. Case is closed.		X	
36	G68	Mullaney L W	334 Market Street	EDR US Historical Cleaners	WNW/Higher 431 feet	Known as a former or existing dry cleaner.		X	
Study Area – Additional Trackwork South of the Caltrain Railyard									
37		Greyhound Garage	480 Irwin Street	LUST	W/ 400 feet	Listed as a LUST. Case closed.		X	
38		Chevron Station #9-0294	1200 Seventh Street	LUST	E/ 100 feet	Known as former gasoline service station. Listed as a LUST. Case is closed.		X	
39		Mariposa Street and Hwy 280	880 Mariposa Street Vicinity	LUST	E/ 200 feet	Listed as a LUST. Contaminated soil only. Case is closed.		X	
40		Direct Mail Service	209 Mississippi Street	LUST	W/ 425 feet	Listed as a LUST. Gasoline affected soil only. Case is closed.		X	
41		Macor, Inc.	1200 17th Street	LUST, Historical CORTESE	W/ 410 feet	Listed as a LUST. Gasoline affected groundwater. Case is closed.		X	

Notes:

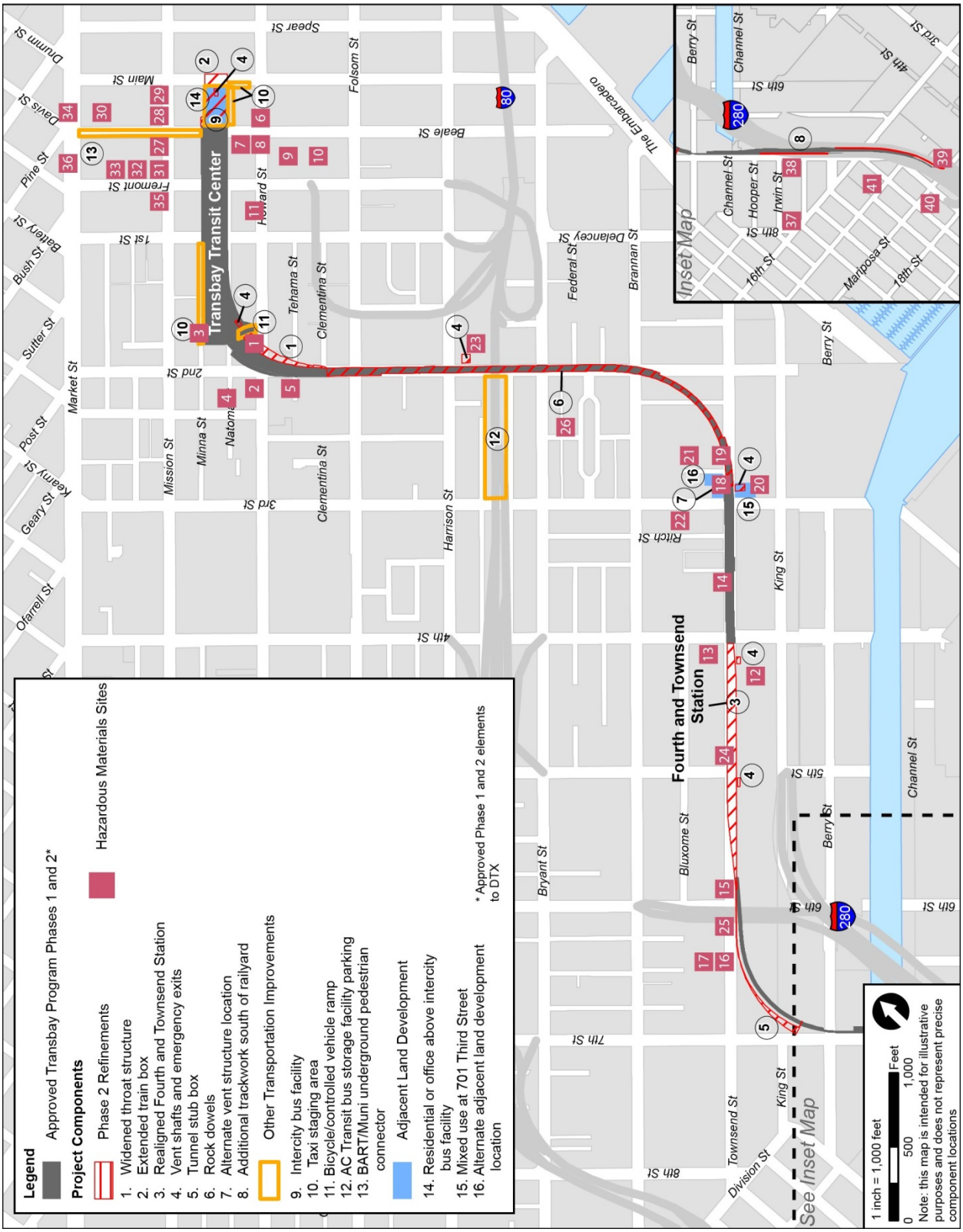
[1] No known hazardous materials sites for the vent structure at Second and Harrison Streets, Transit Center vent structures, intercity bus facility and adjacent development, or taxi staging area. The intercity bus facility would be constructed atop the extended train box, and any hazardous materials would have already been detected and addressed during construction of the extended train box. The additional trackwork south of the Caltrain railyard, taxi staging area, and AC Transit bus storage parking facility would not involve any subsurface work and, therefore, would have no potential to encounter contaminated soils or groundwater. The installation of rock dowels is not addressed since this project component would be within the footprint and environmental conditions previously evaluated in the 2004 FEIS/EIR for the tunnel segment construction; any environmental contamination encountered for the rock dowel installation would be addressed as part of the tunnel construction.

Table 3.10-1
Known Hazardous Materials Sites in the Proposed Project Study Area[1]

Listed # in this Table and Figure 3.10-1	EDR Map ID	Site Name	Site Address	Case Type	Location with Respect to The Project (Direction/ Distance in feet)	Status	Potential Construction-Related Hazard		
							None[2]	Indirect[3]	Direct[4]

[2] Sources of potential contamination are judged to be sufficiently far from proposed construction activities that environmental impacts are not anticipated.
[3] Properties adjacent to proposed construction areas or properties where the presence of potential sources is not well defined relative to planned construction. Also in this category are fuel leak closed cases, due to potential residues of petroleum hydrocarbons in soil and groundwater.
[4] Properties where proposed construction may pass directly through areas of potential contamination.
[5] Higher = Means the site is topographically higher than the proposed project component or up-gradient. Up-gradient sites were chosen due to the greater possibility of subsurface migration of contaminants from an environmental concern site with a leak or spill toward the proposed project component. In general, subsurface migration of contaminants follows surface topography.
[6] LUST = leaking underground storage tank
[7] CA FID UST = California Facility Inventory Database for Underground Storage Tanks
[8] CORTESE = The State of California Hazardous Waste and Substances Site List (also known as the "Cortese List") is a planning document used by the state, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials sites.
[9] RCRA-SQG = Resource Conservation and Recovery Act Small Quantity Generator of Hazardous Waste
[10] FINDS = The Facility Index System (FINDS) is a central and common inventory of facilities monitored by the EPA, with cross-reference to the program office databases that have additional information about the facility.
[11] HAZNET = Hazardous Waste Information System. Data extracted from copies of hazardous waste manifests received by the California Department of Toxic Substances Control.
[12] RCRA-LQG = Resource Conservation and Recovery Act Large Quantity Generator of Hazardous Waste
[13] SWEEPS UST = The Statewide Environmental Evaluation and Planning System lists known underground storage tanks

PG&E = Pacific Gas & Electric
SLIC = Spills, Leaks, Investigation and Cleanup database is maintained by the Regional Water Quality Control Boards.



Sources: City and County of San Francisco 2013; compiled by Aetypic 2014; adapted by AECOM in 2015

Figure 3.10-1 Known Hazardous Materials Sites in the Proposed Project Study Area

Federal

Resource Conservation and Recovery Act and Community Environmental Response Facilitation Act of 1992

Several federal statutes govern the use, storage, handling, transport, and disposal of hazardous materials, hazardous substances, and hazardous wastes. The two statutes of most importance to this analysis are the Resource Conservation and Recovery Act (RCRA) (as amended by the Federal Facilities Compliance Act of 1992) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"), as amended by the Superfund Amendments and Reauthorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment. The EPA is the lead agency for enforcing these laws governing hazardous materials that affect public health or the environment. In California, the EPA has granted most enforcement authority over federal hazardous materials regulations to the California Environmental Protection Agency (CalEPA).

Clean Air Act

The Clean Air Act protects the general public from exposure to airborne contaminants that are known to be hazardous to human health. Under the Clean Air Act, EPA established National Emissions Standards for Hazardous Air Pollutants, which are emissions standards for air pollutants, including asbestos. Specific standards for asbestos are found in Title 40, CFR, Part 61, Subparts A, B, and M.

Clean Water Act (Section 402[p])

The Clean Water Act regulates discharges and spills of pollutants, including hazardous materials, to surface waters and groundwater.

Toxic Substances Control Act (15 USC Section 2601 et seq.)

The Toxic Substances Control Act regulates the manufacturing, inventory, and disposition of industrial chemicals, including hazardous materials.

Hazardous Materials Transportation Act (49 USC Sections 1801–1819 and 49 CFR Parts 101, 106, 107, and 171–180)

The Hazardous Materials Transportation Act regulates the transport of hazardous materials by motor vehicles, marine vessels, and aircraft.

Emergency Planning and Community Right to Know Act (40 CFR Parts 350–372)

This act regulates facilities that use hazardous materials in quantities that require reporting to emergency response officials.

Federal Compliance with Pollution Control [Executive Order 12088]

This act requires federal agencies to take necessary actions to prevent, control, and abate environmental pollution that results from federal facilities and activities that federal agencies control.

Other Federal Regulatory Requirements

- U.S. Occupational Safety and Health Administration (OSHA) 29 CFR, 1926.1101 – Asbestos Standard for Construction
- U.S. EPA 40 CFR, Part 231 – Standards for Universal Waste Management

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts related to hazardous materials, and to avoid or mitigate those impacts when feasible.

California Environmental Protection Agency

Under the authority of CalEPA, the California Department of Toxic Substances Control (DTSC), Certified Unified Program Agency (CUPA), and San Francisco Bay Regional Water Quality Control Board (RWQCB) are responsible for overseeing the cleanup of contaminated sites in the City. Regulations implementing the state's hazardous materials and waste laws are contained in Title 22 and Title 23 of the California Code of Regulations. The state's hazardous waste inspection and enforcement is coordinated by the CUPA. The DTSC also regulates disposal of hazardous wastes under California's Hazardous Waste Control Law, Health and Safety Code Section 25242 et seq. The owner of the property where hazardous waste is generated must have a Hazardous Waste Generator Number assigned by and registered with the DTSC. The contractor and/or hauler of the material are required to file a Hazardous Waste Manifest that details the hauling and disposal of hazardous materials.

Fluorescent lighting tubes and ballasts, computer displays, and several other common items containing hazardous materials are regulated as "universal wastes" by CalEPA. These materials may be encountered by workers prior to building demolition and renovation activities. Universal waste regulations allow common, low-hazard wastes to be managed under less-stringent requirements than other hazardous wastes.

Lead and Lead-Based Paint

CCR Title 22 considers waste soils with concentrations of lead to be hazardous if they exceeds a total concentration of 1,000 parts per million and a soluble concentration of 5 parts per million. Typically, building materials with lead-based paint attached are not considered hazardous waste (CCR Chapter II, Division 4.5, Title 22) unless the paint is chemically or physically removed from the building debris. Both OSHA and the California Division of Occupational Safety and Health (Cal/OSHA) regulate worker exposure during construction activities that involve exposure to lead-based paint.

The Interim Final Rule found in 29 CFR 1926.62 covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for repainting, renovation, cleanup, and routine maintenance. The OSHA-specified method of compliance includes respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training.

In addition, once a structure containing lead-based paint has been properly demolished, federal and state requirements for future unrestricted residential reuse areas are in place to verify that areas around a former structure were not contaminated with lead before or during the demolition process.

California Accidental Release Prevention Program

Under this program, businesses that use large quantities of acutely hazardous materials must prepare a detailed engineering analysis of the potential accident factors present at a business, and the mitigation measures that can be implemented to reduce this accident potential.

California Division of Occupational Safety and Health

Cal/OSHA enforces state worker health and safety regulations related to construction activities. Regulations include exposure limits, protective clothing, and training requirements to prevent exposure to hazardous materials. Cal/OSHA also enforces occupational health and safety regulations specific to lead and asbestos investigations and abatement that equal or exceed federal requirements. Where there is asbestos-related work involving 100 square feet or more of asbestos-containing material, asbestos abatement contractors must follow state regulations contained in 8 CCR 1529 and 8 CCR 341.6–341.14. Asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California. Workers conducting asbestos abatement must be trained in accordance with state and federal OSHA regulations, and the local office of Cal/OSHA must be notified of proposed asbestos abatement. Due to their age, some of the structures proposed for demolition or possible alteration for the project may contain asbestos.

San Francisco Bay Regional Water Quality Control Board

The proposed project area is located within the jurisdiction of the San Francisco Bay RWQCB. The RWQCB is authorized by the State Water Resources Control Board to enforce the provisions of the Porter-Cologne Water Quality Control Act of 1969, which incorporates federal water protection laws. This act gives the RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the state has been or could be threatened, and to remediate the site if necessary.

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local governments and private agencies. Responding to hazardous materials incidents is one part of this plan. The plan is administered by the California Emergency Management Agency (formerly Governor's Office of Emergency Services), which coordinates the responses of other agencies, including CalEPA, California Highway Patrol, the California Department of Fish and Wildlife, the San Francisco Bay RWQCB, and the San Francisco Fire Department (SFFD). The SFFD provides first response capabilities, if needed, for hazardous materials emergencies within the area covered by the proposed project. The San Francisco Department of Emergency Management leads the City in planning, preparedness, communication, response, and recovery for daily emergencies, large-scale citywide events, and major disasters. The Department of Emergency Management also oversees and coordinates preparation of the City's Hazard Mitigation Plan, which identifies natural and human-made hazards in the City, and actions to reduce or eliminate risk to human life and property from hazards such as earthquakes, floods, or terrorist attacks.

Other State Regulatory Requirements

- Title 8, CCR, Chapter 4, Section 5208, General Industry Safety Orders
- Bay Area Air Quality Management District (BAAQMD) Regulation 11, Rule 2 – Asbestos Demolition, Renovation, and Manufacturing
- Cal/OSHA Construction Safety Orders, Lead CCR, Title 8, Section 1532.1, effective November 4, 1993 (revised March 7, 1997)

Local

San Francisco Department of Public Health

The San Francisco Department of Public Health (SFDPH) enforces most regulations pertaining to hazardous materials in the City and County of San Francisco (San Francisco Health Code Article 21:

Hazardous Materials). The SFDPH regulates site mitigation under the Site Mitigation Program. The SFDPH Hazardous Materials Unified Program Agency also regulates hazardous waste storage, generation, and accidental release under the Certified Unified Program Agency program.

SFDPH Hazardous Materials and Waste Plan. Businesses that handle hazardous materials in excess of specified quantities must report their chemical inventories to the Hazardous Materials Unified Program Agency by preparing a Hazardous Materials Plan to inform the community about chemical use, storage, handling, and disposal practices. The Hazardous Materials Plan is also intended to provide essential information to fire fighters, health officials, planners, elected officials, workers, and their representatives so that they can plan for and respond to potential exposures to hazardous materials. Any hazardous materials use, storage, handling, or disposal by the proposed project would be subject to these reporting requirements.

Maher Ordinance. The Maher Ordinance requires site assessments at specified sites located east of the historic high tide line where the land has been filled, unless a waiver is granted by the Director of the SFDPH. Depending on the results of the site assessments, mitigation can be required to clean up hazardous materials identified in the soil. The Maher Program, San Francisco Health Code Article 22A, applies to the following sites: Maher area mapped sites; areas currently or previously zoned as industrial; areas currently or previously with industrial land uses; areas within 150 feet of Highway 101, Interstate 80, or Interstate 280; areas of Bay fill; areas within 100 feet of a known hazardous waste site (GeoTracker/EnviroStor); and areas within 100 feet of an underground storage tank (City and County of San Francisco 2014). The proposed project component sites meet one or more of the listed Maher Program requirements.

In addition, the San Francisco Board of Supervisors amended Health Code Article 22A (effective August 24, 2013), which requires sponsors for projects on sites that are known or suspected to contain contaminated soil and/or groundwater to retain the services of a qualified professional to prepare a Phase I Environmental Site Assessment that meets the requirements of Health Code Section 22.A.6. Also, among the requirements of the Maher Program is the preparation of a mitigation plan to deal with contaminated soil and groundwater. If the site history reveals that there may be hazardous substances in the soil or groundwater, a work plan must be submitted to the SFDPH for review and approval. If concerns are identified during the sampling, a site mitigation plan will be required. Upon successful implementation of the mitigation plan, the SFDPH will provide notification of compliance with Article 22A (the Maher Ordinance). Approval by the SFDPH is required prior to issuance of approval from the Department of Building Inspection (DBI) to commence a project. The proposed project component sites are located on the Maher Map, which indicates the potential for contaminated soil and/or groundwater; therefore, they are subject to the Maher Program.

San Francisco Department of Building Inspection

San Francisco Health Code Chapter 34, Section 3407, establishes requirements for projects that disturb lead-based paint on the exterior of buildings or steel structures. The requirements are implemented by the DBI. The ordinance contains performance standards, including a requirement to establish containment barriers that are at least as effective at protecting human health and the environment as those in the most recent Guidelines for Evaluation and Control of Lead-Based Paint Hazards promulgated by the U.S. Department of Housing and Urban Development.

Bay Area Air Quality Management District

Section 19827.5 of the California Health and Safety Code, adopted January 1, 1991, requires that local agencies 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 BAAQMD has the 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 abatement work. Notification includes the names and addresses of operations and persons responsible for the work; description and location of the structure to be demolished/altered, including size, age, and prior use, and the approximate amount of friable asbestos; scheduled starting and completion dates of demolition or abatement; the nature of planned work and methods to be employed; the procedures to be employed to meet BAAQMD requirements; and the name and location of the waste disposal site to be used. The BAAQMD randomly inspects asbestos removal operations. In addition, the BAAQMD will inspect any removal operations for which a complaint has been received.

City and County of San Francisco Emergency Response Plan (Evacuation Routes)

The authority for evacuation orders, along with managing the movement of evacuees, is the responsibility of the San Francisco Police Department (SFPD), with logistical support by many other City departments. Evacuation authorities are defined at both the State and City levels in the Closing Areas in Emergencies Section of the California Penal Code 409.5(a) and the Government Code, Section 8607. In addition to SFPD, other officials may issue an evacuation order. The order can be issued by the Mayor in consultation with the San Francisco Department of Emergency Management (DEM) Director and/or the Policy Group

Evacuation routes will be established by SFPD, in collaboration with Department of Public Works (DPW), Municipal Transportation Agency (MTA), California Department of Transportation (Caltrans), and California Highway Patrol (CHP). MTA will staff traffic control points until the above listed departments have sufficient resources to implement road and street closures. Evacuation routes in the Financial District are identified in Appendix D: Financial District Evacuation Plan to the City's Emergency Response Plan Emergency Support Function #1: Transportation Annex (no date); however, the appendix was not available at the time of this document's preparation.

DPW will place message boards at requested intersections to divert traffic along the evacuation routes if required SFPD, San Francisco Sheriff's Department (SFSD), and CHP will provide security by setting up roadblocks, barricades, and/or a system of patrols; DPW may also provide assistance with barricades.

3.10.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or wastes;
- 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;
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination in excess of applicable environmental screening levels;

- be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5, and, as a result, create a significant hazard to the public or the environment;

- be located in an adopted airport land use plan for a public-use airport, resulting in a safety hazard for people residing and working in the project area;

- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildland is adjacent to urbanized areas or where residences are intermixed with wildland; or

- impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Issues Not Addressed Further in this SEIS/EIR

Airport Land Use Plan. The Transbay Program is not within an area covered by an adopted airport land use plan, and this issue was not discussed in the 2004 FEIS/EIR. The environmental setting with respect to an adopted airport land use plan has not changed since the 2004 FEIS/EIR; therefore, this issue is not discussed further in this SEIS/EIR.

Wildland Fires. The Transbay Program area is not within a California Department of Forestry and Fire Protection fire hazard zone and was not discussed in the 2004 FEIS/EIR. The environmental setting with respect to wildland fire hazard zones has not changed since the 2004 FEIS/EIR; therefore, this issue is not discussed further in this SEIS/EIR.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the hazardous materials effects will be the same as those presented in Section 5.15 Hazardous Materials (page 5-111) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects and Mitigation Measures HWO 1 through HWO 7, and HMC 1 through HMC 10, previously adopted and incorporated into the Transbay Program, is provided below. The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR.

- **HMC 1** – TJPA shall follow California OSHA and local standards for fire protection and prevention. Handling and storage of fuels and other flammable materials during construction will conform to these requirements, which include appropriate storage of flammable liquids and prohibition of open flames within 50 feet of flammable storage areas.

- **HMC 2** – TJPA shall perform detailed investigations of the potential presence of contaminants in soil and groundwater prior to construction, using conventional drilling, sampling, and chemical testing methods.

- **HMC 3** – TJPA shall cover with plastic sheeting soils removed during excavation and grading activities that remain at a centralized location for an extended period of time to prevent the generation of fugitive dust emissions that migrate off-site.

- **HMC 4** – TJPA shall use a licensed waste hauler, applying appropriate manifests or bill of lading procedures, as required to haul soil for disposal at a landfill or recycling facility.

- **HMC 5** – TJPA shall use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works as well as to evaluate requirements for pretreatment prior to discharge to the sanitary sewer.

- **HMC 6** – TJPA shall develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater prior to starting project construction.

- **HMC 7** – TJPA shall design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions.

- **HMC 8** – TJPA shall require that workers performing activities on site that may involve contact with contaminated soil or groundwater have appropriate health and safety training in accordance with 29 CFR 1910.120.

- **HMC 9** – TJPA shall review existing asbestos surveys, abatement reports, and supplemental asbestos surveys, as warranted. Perform an asbestos survey for buildings to be demolished, as required. Asbestos-containing building materials (ACM) will require abatement prior to building demolition. Removal and disposal of ACM will be performed in accordance with applicable local, state, and federal regulations.

- **HMC 10** – TJPA shall perform a lead-based paint survey for buildings to be demolished to determine areas where lead-based paint is present and the possible need for abatement prior to demolition.

Operational Use of Hazardous Materials or Waste and Accidental Release. The storage yard options will contain a fueling facility to provide diesel to non-electric locomotives served by the Caltrain railyard. In addition, cleaning solvents associated with the routine maintenance operations will be present on-site. Handling and storage of fuels and solvents will follow Cal/OSHA and local standards for fire protection and prevention. In addition to the handling and storage procedures described above, a Hazardous Materials Management/Business Plan will be filed with the SFDPH. This is essentially the permit for the storage of these materials at the site. Mitigation to prevent hazardous materials impacts identified in the 2004 FEIS/EIR relies on the mitigation measures summarized below:

- **HWO 1** – construct and operate any fueling facility in compliance with local, state and federal regulations regarding handling and storage of hazardous materials.

- **HWO 2** – equip diesel fuel pumps with emergency shut-off valves and, in compliance with U.S. EPA requirements; equip fuel Underground Storage Tanks (USTs) with leak detection and monitoring systems.

- **HWO 3** – employ secondary containment systems for any aboveground storage tanks.

- **HWO 4** – store cleaning solvents in 55-gallon drums, or other appropriate containers, within a bermed area to provide secondary containment.

- **HWO 5** – slope paved surfaces within the fueling facility and the solvent storage area to a sump where any spilled liquids could be recovered for proper disposal.

- **HWO 6** – follow California OSHA and local standards for fire protection and prevention for the handling and storage of fuels and solvents.

- **HWO 7** – prepare a Hazardous Materials Management/ Business Plan and file with the SFDPH.

The 2004 FEIS/EIR concluded that hazardous materials impacts during operation will have a no adverse effect/less-than-significant impact with implementation of mitigation measures.

Construction-Related Hazardous Materials Impacts (Use, Transport, Disposal, Accidental Release, Hazardous Materials Sites). Some hazardous materials, primarily fuels and motor oils, paints, cleaners, and degreasers, will be used during construction. These materials are considered hazardous based on their physical properties, and improper handling potentially can endanger workers and the public, and also can result in contamination of soil and/or water. Contact with contaminants in the project area can have adverse effects on worker, public, and environmental health and safety. The degree of hazard associated with these impacts on human or environmental receptors is a function of the chemical properties, concentrations, and volume of contaminants; nature and duration of construction activities; and contaminant migration pathways.

At the time of the 2004 FEIS/EIR, 41 identified hazardous material sites were identified in proximity to the alignment that will be disturbed during construction. Construction activities such as excavation, installation of deep foundations, or site dewatering within existing contaminated areas can increase the spread of contaminants to surface waters or other groundwater zones, and disposal of contaminated soil will transport contaminants out of the project area. To mitigate construction-related hazardous materials impacts, the following mitigation measures were adopted in the 2004 FEIS/EIR and are currently being implemented as part of Phase 1 construction:

- **HMC 1 –** during construction shall follow Cal/OSHA and local standards for handling and storage of fuels and other flammable materials.

- **HMC 2 –** prior to construction, investigate the potential presence of contaminants in soil and groundwater. Based on the test results, develop a mitigation plan that follows the requirements of Article 22A (the Maher Program).

- **HMC 3 –** cover soils removed during grading and excavation to minimize off-site migration of fugitive dust.

- **HMC 4 –** use licensed waste hauler to haul soil for disposal at a landfill or recycling facility.

- **HMC 5** – use chemical test results for groundwater samples to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works, and if contamination is identified, appropriate treatment shall be applied.

- **HMC 6** – develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater prior to starting project construction.

- **HMC 7** – design dewatering systems to minimize downward migration of contaminants.

- **HMC 8** – require appropriate health and safety training in accordance with 29 CFR 1910.120 for workers performing activities on-site that may involve contact with contaminated soil or groundwater. Develop a Worker Health and Safety Plan and monitor for implementation by a Certified Industrial Hygienist.

- **HMC 9 –** identify, remove, and dispose of asbestos-containing materials (ACM) in accordance with applicable federal, state, and local regulations.

- **HMC 10 –** require a lead-based paint survey to determine areas where lead-based paint is present and the possible need for abatement prior to demolition.

The 2004 FEIS/EIR concluded that hazardous materials impacts during construction will have a no adverse effect/less-than-significant impact with the implementation of mitigation measures.

Proposed Project

Because the proposed project components consist of Phase 2 refinements, other transportation improvements, and land development at or adjacent to elements of Phase 2 of the Transbay Program, the 2004 FEIS/EIR addresses hazardous materials and impacts in the proposed project area. The assessment below is, therefore, substantially similar to the 2004 FEIS/EIR, although more current information and technical analyses have been incorporated to refine potential hazardous materials impacts for the proposed project component sites. For example, an updated database search was performed and a closer examination of the proposed project component sites was performed for this SEIS/EIR. Mitigation Measures HWO 1 through HWO 7 and HMC 1 through HMC 10, which were previously identified in the 2004 FEIS/EIR for the Transbay Program and adopted and incorporated into the project, would apply to the hazardous materials impacts identified for the proposed project, and would be implemented as part of the proposed project. The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR.

Impact HZ-1: The proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or wastes, or through the accidental release of such materials. (No Adverse Effect/Less-than-Significant Impact)

Of the proposed project components, only two would potentially involve the use of hazardous materials or wastes: the backup emergency generators at the vent structures that necessitate the use of small above-ground diesel storage tanks, and the possibility of fueling facilities at the intercity bus facility.

The use of backup emergency generators at the vent structures would involve the use of diesel fuel, stored in above-ground storage tanks. Similarly, the possible fueling of Greyhound, Amtrak, and other intercity buses at the intercity bus facility would involve underground storage tanks to store the fuels, and regular refilling of these tanks. The periodic delivery of diesel fuel to fill the storage tanks at these proposed project components may create accidental fuel releases on the road or on-site. A search of governmental databases indicates that there are 13 schools within a 0.25-mile radius of proposed project components that could be associated with such spills. Transportation of hazardous materials such as diesel fuel is regulated by the California Highway Patrol and the California Department of Transportation. The proposed project would comply with these regulations, including display of proper placards on vehicles containing hazardous materials, and appropriate licensing of drivers. Even though these safeguards are in place, accidental releases during the unloading of diesel fuel or due to other equipment or maintenance failure at the proposed sites could result in an inadvertent spill or release. Depending on the amount released, this accidental release could adversely affect the public and/or the environment.

Potential operational impacts from the routine transport, use, disposal, or accidental release of hazardous materials or wastes would be considered not adverse/less than significant because Mitigation Measures HWO 1 through HWO 7, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would apply to the proposed project and would be implemented as part of the proposed project. In addition, the proposed project would be required to implement and comply with applicable hazardous materials regulations and standards.

Impact HZ-2: The proposed project would not create a significant long-term operational hazard to the public or the environment through exposure to existing hazardous materials contamination. (No Adverse Effect/Less-than-Significant Impact)

The proposed project components were evaluated to determine their potential to cause workers, the public, and/or the environment to come into contact with hazardous materials or wastes during the operation period. Available reports, maps, and EDR records according to the American Society for Testing and Materials' Standard Practice for Phase I Environmental Site Assessment (E1527-05) were reviewed to identify potential hazards and hazardous materials in the proposed project area.

Table 3.10-1 shows the known hazardous materials sites in proximity to the proposed project components. As noted earlier and shown in Table 3.10-1, most of the known hazardous materials sites involve former gas stations, dry cleaning operations, and underground storage tanks. Summarizing from Table 3.10-1, Table 3.10-2 shows the number of hazardous materials sites that could directly or indirectly affect the proposed project components. Those sites that are classified as "Direct" lie within a proposed project component footprint; those sites that are classified as "Indirect" are proximate to a proposed project component footprint and the areal extent of contamination is not well characterized, or there are underground storage tanks proximate to the proposed project component footprint that may still have residual contamination, even though the case is closed.

Six of the known hazardous materials sites in the proposed project area involve Cortese List sites. The California Hazardous Waste and Substances Site List (also known as the "Cortese List") is a planning document used by state and local agencies, and developers to comply with the CEQA requirements in providing information about the location of hazardous materials sites. The proposed site for the vent structure at 701 Third Street and adjacent land development (currently a fast food restaurant) was formerly on the Cortese List as a former gas station. The gas station was removed and the site was likewise removed from the Cortese List. The remaining five Cortese sites are LUST cases, which have been closed, indicating that the regulatory agencies were satisfied with the remediation at those sites and no further action is required.

Although there is known contamination in the soils and groundwater at and near the proposed project components that are shown in Table 3.10-2, compliance with the requirements and regulations to clean the site for construction worker and public safety prior to project operations means that there would be no long-term operational exposure to environmentally contaminated sites post-construction that could pose a risk to the public or the environment. In addition, Mitigation Measures HMC 2, HMC 5, HMC 6, HMC 7, and HMC 8, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would apply to the proposed project, and would be implemented as part of the proposed project. These measures would require developing a sampling plan, chemical testing of groundwater samples to evaluate requirements for pretreatment prior to discharge, developing a mitigation plan for handling contaminated soil and groundwater prior to construction, designing dewatering systems to minimize downward migration of contaminants, and developing a Worker Health and Safety Plan.

Table 3.10-2
Number of Known Hazardous Materials Site by Proposed Project Component

Proposed Project Component: DTX Refinements	**Direct**	**Indirect**
Widened Throat Structure	3	2
Extended Train Box	0	6
Realigned Fourth and Townsend Street Station[1]	1	3
Vent Shafts/Emergency Exits		
Vent Structure at Fifth and Townsend Streets	1	1
Vent Structure at Fourth and Townsend Streets	0	3
Vent Structure at 701 Third Street/Alternate Site at 699 Third Street and 189 Townsend Street	1	4
Vent Structure at Second and Harrison Streets	1	0
Vent Structure at Second and Natoma Streets	0	1
Vent Structure at Natoma and Main Streets	0	0
Tunnel Stub Box	0	3
Rock Dowels	Area was assessed in the 2004 FEIS/EIR	
Additional Trackwork South of the Caltrain Railyard	0	5
Proposed Project Component: Other Transportation Improvements		
Intercity Bus Facility	0	6
Taxi Staging Area	0	0
Bicycle/Controlled Vehicle Ramp	1	0
AC Transit Bus Storage Facility Parking	0	1
BART/Muni Underground Pedestrian Connector	3	7
Proposed Project Component: Adjacent Land Development[2]		
Above the Intercity Bus Facility	0	6
Adjacent to the Vent Structure at 701 Third Street/Adjacent to alternate Site at 699 Third Street and 189 Townsend Street	1	4

Notes:
[1] Based on the results from the two vent structures at this station.
[2] Based on the adjacent transportation improvement.
Sources: Compiled by Aetypic in 2014 and AECOM in 2015

Impact HZ-3: The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (No Adverse Effect/Less-than-Significant Impact)

The proposed project is not expected to affect or impair an emergency response, implementation, or evacuation plan. Most of the proposed project components involve refinements to infrastructure needed to enable safe Caltrain and HSR service, or transportation system improvements that serve to enhance connectivity for vehicles, pedestrians, and bicycles. Overall, the Transbay Program, which would be augmented by the proposed project components, is expected to have a beneficial impact on emergency operations by reducing automobile travel. The proposed vent structures are specifically needed for life safety and emergency response. These facilities comply with the National Fire Protection Association and the City's fire protection standards and codes.

Other proposed project components that would be underground (i.e., the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, rock dowels, bicycle/controlled vehicle ramp, and underground pedestrian connector) would have no permanent features at or above street level, and would not result in substantial new trips in the proposed project area

that would increase congestion on local streets. Therefore, these proposed project components would not physically interfere with emergency response or access.

Proposed project components that could alter local circulation during operations, such as the additional trackwork south of the Caltrain railyard, the intercity bus facility, taxi staging area, and AC Transit bus storage parking facility, were evaluated in Section 3.2, Transportation, of this SEIS/EIR, and would not impede emergency response. Three proposed project components would involve potential adjacent development on portions of the project sites. The additional traffic associated with these land uses was evaluated in Section 3.2, and would not result in substantial new vehicular trips that would adversely affect intersection operations or otherwise delay emergency response vehicles.

In light of the above review of the proposed project components, impacts on emergency response plans or emergency evacuation plans would not be considered adverse or significant.

Impact C-HZ-4: Ground-disturbing and excavation activities associated with construction of the proposed project would not expose construction workers, the public, or the environment to known hazardous materials sites. (No Adverse Effect /Less-than-Significant Impact)

As described in Impact HZ-2, above, there are known hazardous materials sites at or near the sites of the proposed project components. Table 3.10-1 identifies those sites with potential environmental concern. Nearby upgradient sites with contaminated groundwater could affect proposed project components where excavation is involved. Many of the proposed project components overlie shallow groundwater and would require dewatering, which could lead to discovery of contaminated materials. During project construction, workers could be exposed to soil and/or groundwater containing hazardous substances via direct contact (ingestion or dermal contact) with contaminated soil and/or groundwater or via airborne pathways (inhalation of vapors). The public and environment could be exposed to contaminants that are transported off-site during construction.

In reviewing the EDR and Table 3.10-1, the existing fast food restaurant site at 701 Third Street was a former gasoline service station, according to the Sanborn Map dated 1950. The EDR lists the site as a former gasoline station in maps from 1953 and 1958. Although this use has long been replaced, petroleum hydrocarbons in soil and shallow groundwater may be encountered during soil excavation and dewatering as part of constructing the vent structure at 701 Third Street.

Although there is known contamination in the soils and groundwater at and near the proposed project components (Table 3.10-2), potential construction impacts regarding hazardous materials sites would be less than significant because Mitigation Measures HMC 1 through HMC 8, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would apply to the proposed project, and would be implemented as part of the proposed project. These measures would require following Cal/OSHA and local standards, developing a sampling plan, chemical testing of groundwater samples to evaluate requirements for pretreatment prior to discharge, developing a mitigation plan for handling contaminated soil and groundwater prior to construction, designing dewatering systems to minimize downward migration of contaminants, and developing a Worker Health and Safety Plan.

Impact C-HZ-5: Demolition or construction activities associated with the proposed project could expose construction workers, the public, or the environment to known hazardous materials sites, including possible asbestos-containing materials and lead-based paints, but this potential effect would be mitigated by previously adopted mitigation measures and compliance with existing regulations. (No Adverse Effect/Less-than-Significant Impact)

The proposed project would involve both demolition of existing facilities and construction of new structures. Structures constructed prior to 1981 may contain asbestos, and structures painted prior to 1978 may have lead-based or lead-containing paint. These buildings may also contain electrical components that contain PCBs and mercury. Improper handling could expose construction workers, the public, and the environment to these hazardous materials. Specific sites that would be affected by the proposed project are described below.

- The proposed widened throat structure near Second and Howard Streets would involve construction that would affect buildings at 235 Second Street and 589 Howard Street. The building at 235 Second Street was constructed in 2001 and encountering hazardous building materials would not be expected. The building at 589 Howard Street was constructed in 1906, and hazardous building materials would likely be encountered during construction of the widened throat structure and could pose a health risk for construction workers, the public, and the environment.

- The proposed extended train box between Beale and Main Streets would involve demolition of the podium structure and surface parking area at the south side of 201 Mission Street. This building was constructed in 1981; therefore, encountering ACM and lead-based paints is unlikely. Electrical components with PCBs and mercury may be found and could pose a health risk for construction workers, the public, and the environment.

- The proposed vent structure at 701 Third Street would involve demolition of a fast-food restaurant that was extensively renovated in 1997. As such, encountering ACM and lead-based paints would not be expected. Electrical components with PCBs and mercury, however, may be found and could pose a health risk for construction workers, the public, and the environment. The alternate vent structure location at the northeast corner of Third and Townsend Streets would involve demolition of two buildings that may contain ACM, lead-based paints, and electrical components with PCBs and mercury. The presence of the hazardous building materials could pose a health risk for construction workers, the public, and the environment.

Cal/OSHA and BAAQMD regulate handling and disposal of asbestos, and contractors are required to comply with these regulations. In addition, potential construction impacts related to ACM and lead-based paint would be considered not adverse/less than significant because Mitigation Measures HMC 9 and HMC 10, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would apply to the proposed project, and would be implemented as part of the proposed project. These measures would require performing asbestos and lead-based-paint surveys of buildings to be demolished, followed by abatement prior to demolition.

Impact C-HZ-6: Construction activities and equipment associated with the proposed project would not result in exposure of construction workers, the public, or the environment to accidental releases of hazardous materials. (No Adverse Effect/Less-than-Significant Impact)

Construction and demolition activities would include use of a variety of diesel-powered equipment, including cranes and excavators. Hazardous materials such as diesel fuel, lubricants, paint, hydraulic fluids, cleaning solvents, and other construction-related materials would be transported and used on-site

during construction. These materials could accidently be released from construction trucks and equipment. Accidental releases or spills of hazardous material at the proposed project component sites and at staging areas could create a health risk for construction workers and the public, and could degrade the environment.

Potential impacts related to the use of hazardous materials during construction would be considered not adverse/less than significant because Mitigation Measures HMC 1 through HMC 8 (summarized in Impact C-HZ-4, above), previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would apply to the proposed project and would be implemented as part of the proposed project.

Cumulative Impacts

Impact CU-HZ-7: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative hazardous materials impacts. (No Adverse Effect/Less-than-Significant Impact)

The geographic scope of this analysis is defined as the area within the Transbay Program; Transit Center District Plan; and Central SoMa, East SoMa, and Mission Bay North Plans. Hazardous materials effects related to exposure to soil and groundwater contamination, spills from construction equipment, and exposure to hazardous building materials are localized. Cumulative hazardous materials effects would, therefore, be most expected if construction, demolition, and exposure to contaminated soils and groundwater were to occur in proximity to other projects and the schedules for these activities overlapped. Because land uses and development in the proposed project area are largely offices, retail, and housing, hazardous materials used in the proposed project area would be typical household and business cleaning agents and not industrial chemicals. Consequently, the cumulative projects would not be expected to involve large quantities of acutely hazardous materials, and cumulative effects would be localized around the proposed project component sites.

The proposed project's construction activities have the potential to expose construction workers, the public, and the environment to hazardous materials. The proposed project's construction activities would require the use, transport, and disposal of hazardous materials and wastes. Cumulative projects could also result in similar releases or risks during construction. The "Regulatory Framework" described earlier in Section 3.10.2, Affected Environment, identifies federal, state, and local statutes, ordinances, and regulations that collectively regulate the use, handling, storage, transport, and disposal of hazardous materials. In particular, the proposed project and cumulative projects in the immediate vicinity would be subject to the City's hazardous materials handling requirements, specified in Article 21 of the San Francisco Health Code, which requires the preparation of a Hazardous Materials Plan. These regulatory requirements would reduce the risk that the public or the environment would be exposed to hazardous materials or wastes from construction and ongoing project operations. In addition, implementation of standard construction practices; application of a Hazardous Materials Plan; OSHA worker's safety requirements; and compliance with applicable regulations, permitting, and California Highway Patrol requirements would reduce the risk for exposure to hazardous materials. Implementation of standard construction practices and compliance with applicable federal, state, and local regulations would reduce the risk of exposure to hazardous materials. Therefore, cumulative impacts from hazardous materials would not be adverse and would be less than significant.

3.10.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Hazardous Materials (Not Adverse)	The 2004 FEIS/EIR concluded that although construction and operation would involve the use, storage, and possible exposure to known and unknown hazardous material sites, the effects would not be adverse. The proposed project analyzed in this SEIS/EIR would not introduce new adverse hazardous materials effects. Therefore, the proposed project would not result in any new adverse effects not identified in the 2004 FEIS/EIR or change the effects in the 2004 FEIS/EIR. No additional mitigation measures beyond those described in the 2004 FEIS/EIR for construction and operational effects would be required for the proposed project.
CEQA Summary	
Impact HZ-1: Hazardous Materials or Wastes (Less than Significant)	The 2004 FEIS/EIR addressed impacts from hazardous materials used in train operations and concluded that with mitigation, a less-than-significant impact related to hazardous materials would occur. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts related to the routine transport, use, disposal, or accidental release of hazardous materials. The proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions. No additional mitigation measures beyond 2004 FEIS/EIR Mitigation Measures HWO 1 through HWO 7, previously adopted and incorporated into the Transbay Program, would be required for the proposed project.
Impact HZ-2: Existing Hazardous Materials Contamination (Less than Significant)	The 2004 FEIS/EIR did not specifically address operational exposure to hazardous materials. Before the start of construction, the TJPA would have cleaned/remediated known or discovered contaminated sites to a level acceptable to the regulatory agencies so that long-term, operational exposure to hazardous materials that could affect the proposed project, the public, or the environment would be less than significant. Therefore, the proposed project analyzed in this SEIS/EIR would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No additional mitigation measures beyond 2004 FEIS/EIR Mitigation Measures HMC 2, HMC 5, HMC 6, HMC 7, and HMC 8 previously adopted and incorporated into the Transbay Program would be required for the proposed project. Refer to Impact HZ-4 and Impact HZ-5, below, for an explanation of the treatment of hazardous materials encountered during construction.
Impact HZ-3: Emergency Response Plan or Emergency Evacuation Plan (Less than Significant)	The 2004 FEIS/EIR did not specifically address impairment or interference with adopted emergency response plans or emergency evacuation plans. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact on emergency operations and would not interfere with emergency response plans. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact C-HZ-4: Construction – Known Hazardous Materials Sites (Less than Significant)	Construction activities could encounter contaminated soil or groundwater and could result in transport of hazardous materials or waste that would be a potentially significant impact on construction workers, the public, or the environment. The 2004 FEIS/EIR identified 41 hazardous material sites in proximity to the alignment that would be disturbed during construction activities. The 2004 FEIS/EIR concluded that with mitigation measures related to sampling, planning, and dewatering systems, a less-than-significant impact would occur from exposure to existing hazardous materials contamination during construction. Implementation of the mitigation measures adopted from the 2004 FEIS/EIR would reduce the impacts to a less-than-significant level from the proposed project analyzed in this SEIS/EIR. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR and would not change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond 2004 FEIS/EIR Mitigation Measures HMC 1 through HMC, previously adopted and incorporated into the Transbay Program, would be required for the proposed project.

Impact C-HZ-5: Demolition or Construction – Hazardous Building Materials (Less than Significant)	The 2004 FEIS/EIR concluded that although ACM and lead-based paint, among other potential hazardous materials, may be encountered during construction, with implementation of the mitigation measures, a less-than-significant impact related to hazardous building materials would occur. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts from hazardous building materials that may be encountered during demolition and construction. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR and would not change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond 2004 FEIS/EIR Mitigation Measures HMC 9 and HMC 10, previously adopted and incorporated into the Transbay Program, would be required for the proposed project.
Impact C-HZ-6: Construction – Hazardous Materials Release (Less than Significant)	The 2004 FEIS/EIR concluded that although hazardous materials may be encountered during construction, with implementation of the mitigation measures, a less-than-significant impact would occur from accidental release or spills of hazardous materials used at the construction sites and staging areas. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts related to accidental release or spills of hazardous materials used at the construction sites and staging areas. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR and would not change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond 2004 FEIS/EIR Mitigation Measures HMC 1 through HMC 8, previously adopted and incorporated into the Transbay Program, would be required for the proposed project.
Impact CU-HZ-7: Cumulative – Hazardous Materials (Less than Significant)	The proposed project, in combination with reasonably foreseeable development, would have a less-than-significant hazardous material impact. The proposed project would not change the cumulative significance conclusions in the 2004 FEIS/EIR.

3.11 ELECTROMAGNETIC FIELDS

3.11.1 Introduction

Electric and magnetic fields occur wherever there is a flow of electricity, and are collectively known as electromagnetic fields (EMFs). The Downtown Rail Extension (DTX) would be electrified through an overhead catenary system that would transmit power to propel the train; it would, thus, produce EMFs. This section describes EMFs, the strength of the fields created by electric-powered transit systems, and the potential implications of EMFs, including public health risks from exposure to such fields. In particular, this analysis focuses on the proposed project components and whether EMF conditions have changed since approval of the 2004 FEIS/EIR.

3.11.2 Affected Environment

EMF Background

Electric and magnetic fields are invisible fields that occur wherever there is a flow of energy. Electric fields are caused by the voltage in a power line. Magnetic fields result from the current in the line. Collectively, these are known as EMFs. Common sources include high-voltage electric power lines, high-voltage transformers, household electronics, telecommunications, and electric motors. EMFs are described in terms of their frequency, or the number of times the EMF changes direction in space, and EMF strength decreases with distance from the source. Electric fields are shielded or weakened by materials that conduct electricity, including trees, buildings, and human skin. Magnetic fields, on the other hand, pass through most materials and are, therefore, more difficult to shield.

EMFs have electrical and magnetic field components. Electric fields result from the strength of the electric charge (voltage), and magnetic fields result from the motion of the charge. Direct currents produce stronger EMFs than alternating currents. Electric field strength is measured in units of volts per meter, and is greater the higher the voltage. Field strength deteriorates rapidly with distance from the source. Magnetic field strength has several units of measure; the most commonly used are milligauss (mG) (one-thousandth of a gauss) and microTesla (10 mG = 1 microTesla). Magnetic fields also deteriorate with distance, but readily pass through most objects. Magnetic fields are typically the radiation of concern when evaluating EMFs. Consequently, EMF strength is measured in terms of milligauss. The rapid drop-off in EMF is evidenced by studies that show the change in magnetic field strength with distance. In the case of magnetic fields from a standard transmission line, the field strength falls geometrically with the distance from the line. For example, the strength of the field directly under such lines is approximately 17 mG, but it falls to approximately 8 mG at 33 feet from the line. At 66 feet, the exposure is less than 4 mG. The level of the magnetic field becomes indistinguishable from levels found inside or outside of homes, exclusive of fields emanating from sources in the home, at a distance of 100 to 300 feet, depending on the design of the line and how much current it is carrying.

The average home in the U.S. has background alternating current magnetic field levels of approximately 1 mG, even when a person is not directly exposed to an electric appliance. Background EMFs and the durations of EMF exposure at home or at work is expected to increase in the future as electrical and electronic systems multiply, unless measures to shield or reduce exposures are implemented. In the U.S., EMFs related to electrical systems are measured at or around the frequency of 60 hertz, which is in the extremely low frequency portion of the electromagnetic spectrum. Alternating current electric energy is generated and distributed at various voltages, but always at 60 hertz. Sixty-hertz electric currents have associated characteristic electric and magnetic fields that are distinguishable from other alternating current frequencies and from direct current (Peninsula Corridor Joint Powers Board and FTA 2009).

Although modern society increasingly relies on electromagnetic systems, strong EMFs are not associated with the normal living and working environment. Examples of EMF intensities from human activities are shown in Table 3.11-1.

Table 3.11-1
EMF Intensities for Common Sources

EMF Source	mG Range
Overhead transmission line	32 to 57 mG (range of exposure to utility workers)
Household appliances	8 to 165 mG (at a distance of 27 cm, or 12 inches)
Computer video display	2 to 4 mG (at 35 cm, or 16 inches)
Rail vehicle (electrically powered)	400 mG (at 110 cm, or 43 inches, from the vehicle floor) to 1,500 mG (at floor level)

Notes:
EMF = electromagnetic field; cm = centimeter; mG = milligauss
Source: FRA 1993

Field measurements performed for the Caltrain electrification program reported relatively low magnetic fields along the corridor between San Francisco and San Jose. The average broadband magnetic field was 0.6 mG and the maximum was 13.9 mG. The broadband fields measured in the Caltrain corridor did not exceed those found in other urban and suburban environments. The magnetic fields in the Caltrain corridor were found to be "consistent with those found in residential and occupational environments that are not associated with high-voltage or high-current equipment" (Exponent Health Group 2001, cited in Peninsula Corridor Joint Powers Board and FTA 2009). For comparison, in the natural environment apart from human activity, the Earth's static magnetic field varies from 300 mG at the equator to more than 600 mG at the magnetic poles.

Sources of electromagnetic radiation appear to be increasing with densification and development, although the effects on EMF levels are indeterminate without historic data. Many modern appliances, electronics, and communications systems have been improved to reduce electromagnetic radiation/EMF levels. The proposed project area contains no known sources of high-level radiation or severe EMF exposures to the general public. EMF exposures, although common, are at a low level.

EMF Effects

Public Health Concerns

The commonly known human-made sources of EMFs are from electrical systems such as electronics, telecommunications, electric motors, and other electrically powered devices. Radiation from these sources is invisible, non-ionizing, and low frequency. Generally, in most living environments, the level of such radiation plus background natural sources of EMFs is low and not considered hazardous. However, under extreme conditions, EMFs can become intense, and hazards include shock and burn. Such conditions are nevertheless rare. As more sources of EMFs are introduced, the extent and level of human exposure increases. The potential biological and health effects are under much study and intense debate. Research to date has not been conclusive about whether there are health risks from long-term exposure to EMFs. Concerns have circled around the potential for EMF sources to be associated with childhood leukemia and, in occupationally exposed adults, chronic lymphocytic leukemia. The associations between cancer and EMFs, however, have not been demonstrated in scientifically controlled cause-effect studies or experimental studies of animals. In light of these uncertain results, agencies such as the California Public Utilities Commission, the regulatory oversight authority for electric transmission lines in the state, do not

believe there is sufficient evidence to suspect health risks, and considers such conclusions, until further research is available, to be unsubstantiated. Considerable research efforts continue, but are largely focused on high-voltage transmissions lines, which exhibit much greater voltage and higher currents than found in electrified rail transit systems.

Electromagnetic Interference

Another concern over EMF generation is the potential interference to other electromagnetic systems that can result when new or more-intense sources of radiation are introduced into the environment. The main sources, or generators, of transient electromagnetic interference (EMI) disturbances from electrification are switching currents produced by switching loads, relays, power controllers, and switch mode power supplies. The effects of EMI are better understood and documented than health-related implications of EMF. EMI may include the interruption, obstruction, or other degradation in the effective performance of electronics and electrical equipment, such as transmitters, computer monitors, and televisions. Depending on the critical nature of this equipment, the effects can have serious consequences for the health and safety of individuals. Perhaps of less concern, but nonetheless important, is that the efficiency of affected systems may be reduced (Peninsula Corridor Joint Powers Board and FTA 2009).

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning EMF and EMF exposure, including new guidance issued since the 2004 FEIS/EIR.

Federal

U.S. Department of Labor, Occupational Safety and Health Administration

The U.S. Occupational Safety and Health Administration (OSHA) developed safety standards for occupational exposure to radio frequency emissions, found at Title 29 CFR 1910.97. The OSHA safety levels do not vary with frequency and are less stringent than the equivalent American National Standards Institute (ANSI), Institute of Electrical and Electronics Engineers (IEEE), and Federal Communications Commission (FCC) maximum permissible exposure (MPE), except for occupational exposure to fields with frequencies that are higher than 5,000 megahertz (MHz), where the OSHA MPE is equal to the ANSI and IEEE C95.1 The OSHA MPEs are based on a 6-minute averaging time.

Federal Communications Commission

FCC Title 47 CFR Part 15 provides rules and regulations regarding licensed and unlicensed radio frequency transmissions. Most telecommunications devices sold in the United States, whether they radiate intentionally or unintentionally, must comply with Part 15. Part 15 does not govern any device used exclusively in a vehicle.

The Office of Engineering and Technology Bulletin 65 provides assistance in evaluating whether proposed or existing transmitting facilities, operations, or devices comply with the limits for human exposure to radio frequency adopted by the FCC.

FCC regulations at Title 47 CFR 1.1310 are based on the 1992 version of the ANSI and IEEE C 95.1 safety standard. The FCC MPEs are based on an averaging time of 30 minutes to exposure of the general public and 30 minutes for occupational exposure. The differences between the ANSI and IEEE C95.1 standards and the FCC MPEs are minor.

U.S. Department of Transportation, Federal Railroad Administration

Title 49 CFR Parts 236.8, 238.225, and 236 Appendix C of the Federal Regulations Code provide rules, standards, and instruction regarding operation characteristics of electromagnetic, electronic, or electrical apparatus, and regarding safety standards for passenger equipment.

Nationally Recognized Organizations

Several organizations have guidelines for EMF exposure, including the IEEE, ANSI, International Commission on Non-Ionizing Radiation Protection (ICNIRP), and American Conference of Governmental Industrial Hygienists. The ICNIRP and IEEE standards both address EMF exposure of the general public and for workers in an occupational setting. The IEEE C95.6 Standard for Safety Levels with Respect to Human Exposure to Electronic Fields, 0 to 6 kilohertz, which is often referenced in the United States and has been formally adopted by the ANSI, specifies a MPE level for the general public and for occupational exposure to extremely low-frequency EMFs, which have frequencies of 0 to 3 kilohertz. In 2003, the ANSI adopted IEEE Standard C95.1 as its standard for safe human exposure to non-ionizing electromagnetic radiation. The C95.1 standard specifies MPE levels for whole and partial body exposure to electromagnetic energy. MPE levels are lower at 100 to 300 MHz because the human body absorbs the greatest percentage of incident energy at these frequencies. MPE standards become progressively higher at frequencies of more than 400 MHz because the body absorbs less energy at these higher frequencies. The IEEE C95.1 standard MPEs are based on radio frequency levels averaged over a 30-minute exposure time for the general public. For occupational exposure, the averaging time varies with frequency from 6 minutes at 450 MHz to 3.46 minutes at 5,000 MHz. IEEE exposure levels are recommendations only, not regulations.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, and to avoid or mitigate those impacts when feasible. Neither CEQA nor the CEQA Guidelines identifies EMF as a hazard of concern, although both speak more generally of the protection of public health and safety and of the need to identify health and safety problems caused by physical changes to the environment or by attracting people to a location that may expose them to hazards.

California Public Utilities Commission

The California Public Utilities Commission filed Decision No. 95-11-013, issued November 1993. Decision No. 95-11-013 found that there was no scientific link between power frequency EMFs and adverse health effects in humans; however, the decision still established steps to address EMFs related to new and upgraded electric utility facilities and power lines in response to public concerns and the scientific uncertainty regarding the potential health effects of EMF exposure.

Local

No applicable local regulations exist.

3.11.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would result in new sources of EMF generation and/or exposure of passengers and/or individuals working on commuter rails systems or passing in the vicinity of such systems to EMFs. Although there are some guidelines and standards adopted by organizations regarding EMF exposure (as described in Section 3.11.2, Affected Environment), and although some states and local authorities have passed laws and ordinances limiting EMF exposure, federal and state agencies have reviewed past studies to determine if exposure to EMFs causes adverse health effects, and have found no basis for setting health standards to date (PG&E 2014). Because of the absence of accepted standards, and because health effects of EMFs remain speculative and inconclusive, no thresholds for EMF generation or exposure have been identified.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project as described in this SEIS/EIR would not be implemented, EMF effects will be the same as those presented in Section 5.13 Electromagnetic Fields (pages 5-83 to 5-84) of the 2004 FEIS/EIR and subsequent addenda. A summary of those previously analyzed effects is provided below.

The No Action Alternative, as approved, includes implementation of electrified passenger rail service (Caltrain) and its attendant systems between the existing Caltrain terminal and the proposed new terminus at the Transit Center now under construction. Extension of the rail service will result in new sources of EMF generation and exposure to passengers and to individuals working on the commuter rail system or passing in the vicinity of the system. The main sources of EMF generation are overhead train power distribution systems; power substations with connecting lines to the major utility lines; passenger facilities with their various electrical systems for lighting, communications, utilities, and fare machines, and their proximity to power distribution networks; and electrically powered rail passenger vehicles.

EMF effects will be limited and not at an intensity that would be of concern for public health or EMI. The field strengths of electrified rail systems are low and below recommended exposure levels. For commuter rail systems, such as that operated by Caltrain, the international voltage used is 25 kilovolts at commercial frequencies (50 to 60 hertz), and this is the voltage proposed for the Caltrain system. According to the 2004 FEIS/EIR, EMF strengths near substations, overhead power systems, and on-board passenger vehicles are likely to be less, or at least no greater than, on the BART system, where measured field strengths are low where public exposure might occur. A subsequent study prepared specifically for the electrification of Caltrain (Peninsula Corridor Joint Powers Board and FTA 2009) reported the following conclusions:

- The EMF environment resulting from an electrified Caltrain will have field levels similar to those of household electrical appliances.

- The EMFs from electrified Caltrain operations will be highest during peak-revenue operations, lessening during lower-volume periods, to become nominal during the late night when trains are not in service or only line maintenance is being performed.

- The field strengths are well below the ranges subject to scientific studies, which have determined that there is no discernible link between low-frequency EMFs and human health effects.

Furthermore, because the rail extension will be almost entirely underground, the potential for non-users and businesses/residences at ground level to experience EMF exposure (particularly, electric fields that are screened by such barriers as buildings, materials, earth, trees, and fences) will be minimal. The Caltrain Electrification Program Environmental Assessment/EIR indicated that projected field strengths are within the "low-frequency" ranges for which the most recent scientific studies have determined no discernible link exists to human health effects (Peninsula Corridor Joint Powers Board and FTA 2009).

The potential for EMI effects from the No Action Alternative will be further reduced by design features of the system that are specified in the DTX Design Criteria: so that all electronic equipment grounding is provided in accordance with the National Electric Code and solidly grounded systems or low-resistance grounded medium voltage systems are used at distribution and utilization voltage levels. A grounding scheme for electrically conductive or metallic materials running along the DTX, such as handrails, walkways, or conduits, will be developed to minimize the flow of stray electrical currents and limit touch potentials to safe levels. Conductors and cables interconnecting equipment and/or cabinets will be enclosed in conduits or raceways (TJPA, PMPC 2009). Installing specialized components, such as filters, capacitors, and inductors, also can reduce EMI susceptibility of certain systems. Because these design features are required by the DTX Design Criteria and because of the absence of potentially significant impacts, no additional restrictions or protective measures for low-intensity EMF exposures attributable to the No Action Alternative are warranted.

For these reasons, the No Action Alternative will result in minimal or no health risks or EMI associated with EMFs, and the 2004 FEIS/EIR concluded that EMF consequences will be not adverse/less than significant.

Proposed Project

Because the proposed project consists of Phase 2 refinements and other transportation improvements and adjacent land development at or adjacent to elements of Phase 2 of the Transbay Program, the 2004 FEIS/EIR addresses the EMF impacts that are directly related to the proposed project. The assessment below is, therefore, substantially similar to the 2004 FEIS/EIR.

Impact EF-1: The proposed project would introduce new sources of EMF generation and exposure, but would not result in health risks or EMI impacts. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The proposed project includes various refinements to Phase 2 of the Transbay Program, as well as other transportation improvements and potential land development. Several proposed project components, including the tunnel stub box and rock dowels, would not result in any electric currents that could be new sources of or generate electromagnetic fields (EMF) and, thus, would have no effect related to EMFs. Other proposed project components would involve electric motors and electric currents and would generate EMFs. These components are the widened throat structure, the extended train box, the vent structures, the intercity bus facility, the bicycle/controlled vehicle ramp, AC Transit bus storage facility parking, the underground pedestrian connector, the additional trackwork south of the Caltrain railyard, and adjacent land use development. The throat structure, vent structure, and AC Transit bus storage facility were all previously evaluated in the 2004 FEIS/EIR, and the changes included as part of the proposed project would not substantially modify or increase their electrical usage. All of these proposed project components would require lighting for safety and security. The vent structures would also require fans and emergency generators, the underground pedestrian connector would possibly also include a moving sidewalk, and the adjacent land development would also include household and office appliances. None of these components would involve high-voltage electric transmission or electric motors that would generate electric fields or magnetic fields that have been associated with substantiated health risks or electromagnetic interference (EMI). Furthermore, the extended train box and the underground pedestrian

connector would be below-grade, which would provide shielding from electric fields generated by these proposed project components.

Construction of the additional trackwork south of the Caltrain railyard would require moving the overhead catenary system (OCS) further east, in closer proximity to existing medical facilities (i.e., the University of California San Francisco campus at Mission Bay adjacent to Interstate 280 and 16th Street). The movement of the OCS could result in EMI that could interfere with sensitive medical and/or research electronic equipment, even though magnetic fields outside the Caltrain right-of-way would be minor in comparison with background concentrations and these fields decrease rapidly with distance. Although impacts related to EMF generation and exposure would not be adverse and would be less than significant, impacts related to EMI could be adverse under NEPA and potentially significant under CEQA if there are nearby sensitive receptors where sensitive equipment may be located.

Mitigation Measure. With implementation of New-MM-EF-1.1, no adverse effect would occur under NEPA, and a less-than-significant impact would occur under CEQA. This same mitigation measure has been implemented on Amtrak's electrified Northeast Corridor and adopted by the Peninsula Corridor Joint Powers Board for the PCEP.

New-MM-EF-1.1 *Evaluate EMI Effects on Nearby Medical Facilities during Final Design of the Additional Trackwork South of the Caltrain Railyard*. During final design, the TJPA shall conduct a site-specific electromagnetic interference (EMI) analysis, based on the OCS alignment, to determine the extent, if any, of disturbance to sensitive electric equipment from the addition of the turnback track, which would be aligned closer to medical and research facilities, such as the University of California San Francisco campus on the east side of the Caltrain right-of-way. If EMI levels result in disturbance to sensitive electric equipment, the TJPA will be responsible for costs related to evaluate, design, monitor, and remediate project-related EMI disruption. More specifically, the following steps will be followed as part of this mitigation measure:

- During final design, the TJPA shall evaluate the specific EMI levels associated with the turnback track at the identified sensitive facilities and determine the appropriate controls necessary to avoid disruption of sensitive equipment prior to testing and commissioning of the proposed project.

- During the testing and commissioning period for the proposed project, EMI levels shall be measured and the TJPA shall coordinate with the identified sensitive facilities to evaluate whether substantial EMI effects are occurring due to system operations. Where substantial EMI effects are detected that disrupt operations of the sensitive electric equipment, the TJPA shall remedy the disruption prior to commissioning of electrified operations through EMF controls and/or shall provide shielding of the sensitive equipment.

- After commissioning of the proposed project, EMI levels shall be monitored during the first year of project operation and reporting of the results shall be shared with any of identified sensitive facilities. Identified disruption of sensitive electric equipment during this period shall be immediately remedied through additional modifications to EMF-

generating equipment along the turnback track and/or additional shielding of the sensitive electric equipment.

EMI can be reduced at the project level through designs that minimize arcing and radiation of radiofrequency energy. Additional mitigation by shielding of sources is not always practical, but susceptibility to EMI can be reduced by choosing devices designed for a high degree of electromagnetic compatibility. The following strategies will be considered, as appropriate by the TJPA, in identifying feasible and effective mitigation for nearby medical electronic equipment:

- passive engineering controls (e.g., shielding with metallic materials at the medical facility where excessive EMI levels are projected);
- partial cancellation of magnetic field with a wire loop, in which an induced current creates a magnetic field of opposite direction;
- active shielding, that requires a power supply and feedback loop to control the induced current and magnetic field direction and magnitude; and
- design modifications to place EMF from the OCS further away or higher up.

Cumulative Analysis

Impact CU-EF-2: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative EMF or EMI impacts. (No Adverse Effect/Less-than-Significant Impact)

The geographic extent of this cumulative analysis is defined as the area within the Transbay Program; Transit Center District Plan; and the Central SoMa, East SoMa, and Mission Bay North Plans because electric and magnetic field strength deteriorates rapidly over distance, rendering proposed-project-generated EMF irrelevant within a larger geographic extent. Past projects, including extensive development of public infrastructure, residence, commercial, and industrial areas contain EMF-generating components, which result in low-level EMF exposure not considered hazardous. The Central Subway light rail extension along Fourth Street is under construction and will be a major transit improvement that will be proximate to the DTX and the proposed project components. Under the cumulative future conditions, the Central Subway and the electrified Caltrain extension (Peninsula Corridor Electrification Project [PCEP]) would be expected to already be constructed and operational. These cumulative projects would increase the dense electrified transit network, including Muni Metro and BART, in the cumulative study area. None of these systems, individually, would produce EMF levels associated with substantiated health concerns or EMI, and each employs design features to reduce the generation of EMFs.

The proposed project area contains no known sources of high-level radiation or severe EMF exposure to the general public, and the proposed project components would generate low EMF levels, which would be in addition to low levels of EMFs in the urban environment. These would not create a cumulatively considerable health risk or EMI. Because the strength of EMFs dissipates rapidly with distance, because electric fields are easily shielded, and because the electrified transit systems that will use the DTX and Transit Center incorporate design measures that control EMFs, cumulative EMF exposures and effects in the proposed project area would not be adverse and would be less than significant.

3.11.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Electromagnetic Fields (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that the Transbay Program would result in minimal or no health risks or EMI associated with EMFs, resulting in no effect related to EMF. The proposed project analyzed in this SEIS/EIR would result in a new adverse effects not identified in the 2004 FEIS/EIR. The future relocation of the electrified Caltrain overhead system further east towards medical institutions, when the additional trackwork south of the Caltrain railyard is constructed, could create EMI effects on sensitive electric equipment. However, implementation of New-MM-EF-1.1 would provide a feasible way to evaluate and mitigate this effect. With implementation of the proposed mitigation measure, the proposed project effects due to generation of and exposure to electromagnetic fields would not be adverse.
CEQA Summary	
Impact EF-1: EMF or EMI (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that the Transbay Program would result in minimal or no health risks or EMI associated with EMFs, resulting in no impact. The proposed project analyzed in this SEIS/EIR would not result in health risks associated with EMFs, but may result in EMI. In particular, the future relocation of the electrified Caltrain overhead system further east towards medical institutions, when the additional trackwork south of the Caltrain railyard is constructed, could create EMI effects on sensitive electric equipment. With implementation of New-MM-EF-1.1, which would provide a feasible way to evaluate and mitigate this effect, the impact would be mitigated to a less-than–significant level. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR.
Impact CU-EF-2: Cumulative – EMF or EMI (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative EMF impacts. The cumulative significance conclusions for the 2004 FEIS/EIR would not change with the proposed project.

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3.12 NOISE AND VIBRATION

3.12.1 Introduction

This section presents information the existing noise and vibration environment in the proposed project area. The principal sources of noise and vibration are identified along with land uses in the area that would be considered sensitive to changes in noise and vibration conditions. Changes to these conditions due to the construction and operation of the proposed project are evaluated and compared to Federal Transit Administration (FTA) noise and vibration guidelines. The analysis focuses on the proposed project component locations and whether noise sources are present and/or if conditions have changed since approval of the 2004 FEIS/EIR. The key issues of concern for noise and vibration include construction activity and operational activities such as bus and taxi noise from the intercity bus facility and taxi staging areas, mobile noise from additional mixed-use development, and parking noise.

Noise is generally defined as unwanted sound. The degree to which noise can affect the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Noise is what we hear when our ears are exposed to small pressure fluctuations in the air. There are many ways in which pressure fluctuations are generated, but typically they are caused by vibrating movement of a solid object. Noise can be described in terms of three variables: amplitude (the fluctuations above and below atmospheric pressure associated with a particular sound wave that can be loud or soft); frequency or pitch (the number of times the fluctuation of air pressure occurs in one second); and time (noise variability over time).

The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The "A-weighted scale," abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. The A-weighted Sound Level is the basic noise unit for transit noise. It describes a receiver's noise at any moment in time. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. This noise analysis describes sound levels in terms of Equivalent Noise Level (L_{eq}), where L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The L_{eq} for one hour is the energy average noise level during the hour. The equivalent noise level is expressed in units of dBA. The City in its Environmental Protection Element of the General Plan indicates new residential development is acceptable, subject to a detailed analysis of noise reduction requirements, in areas with background noise levels up to 70 dB, and new office uses, subject to the same conditions, are acceptable in areas with background noise levels up to 75 dB (City of San Francisco 2010).

Ground-borne vibration is what we sense when a source transmits its energy as a vibration wave that propagates through the ground and nearby building foundations. Individuals may notice vibration through parts of their bodies in contact with vibrating sources or through rattling of windows, items on shelves, and items hanging on walls. The measurement and intensity of vibration are defined by the displacement, velocity, and acceleration of the waves emanating from the source. Ground-borne vibration can be a serious concern, primarily causing buildings to shake and also creating rumbling sounds to be heard. The rumbling sound is called ground-borne noise. It is generally unusual for vibration from buses and trucks to be perceptible, even close to major roads. Common sources of ground-borne vibration are trains, buses on rough roads, and construction activities involving heavy equipment, pile driving, and blasting. Annoyance from vibration typically occurs when vibration levels exceed about 75 Vdb. The threshold of perception is around 65 Vdb, and common ground-borne vibration levels in residential areas would be about 50 Vdb.

3.12.2 Affected Environment

Existing Noise Levels

The proposed project would be implemented along portions of the Downtown Rail Extension (DTX) from the existing tracks at Mariposa Street, to the current Caltrain terminus at Fourth and King Streets to the farthest extent of the new Transit Center. Characteristics of land use shift from mixed-use and low-density industrial and commercial in the southern and western portion near the railyard to high-density office and commercial near the Transit Center that is currently under construction.

Noise levels in urban areas are largely dependent on vehicle traffic volumes and travel speeds, as well as the mix of vehicle types. The existing ambient noise environment within the area containing the proposed project components, typical of most urban areas, is dominated by vehicular traffic. The San Francisco Department of Public Health has mapped transportation noise throughout the City based on modeled baseline traffic volumes derived from the San Francisco County Transportation Authority travel demand model. The modeling results are displayed as day-night noise levels (L_{dn}).[1] Department of Public Health mapping indicates the range of L_{dn} that occurs on every street within the City.

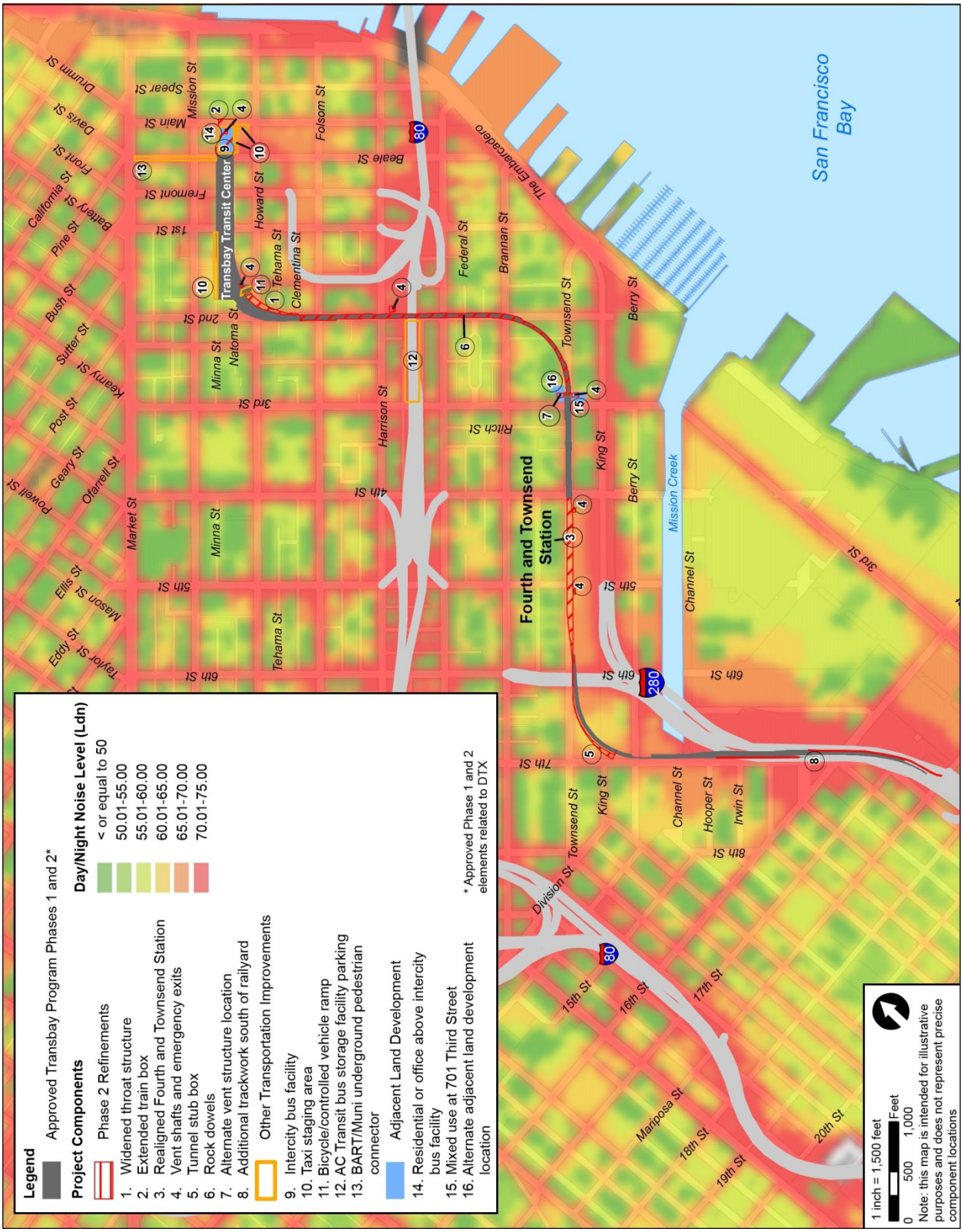
The portion of the map that covers the proposed project components is shown in Figure 3.12-1. Existing noise levels immediately adjacent to the proposed project components generally exceed 65 A-weighted decibels (dBA) L_{dn}. This is consistent with noise levels shown in Table 4.7-1 of the 2004 FEIS/EIR, which shows 24-hour noise levels that range from 65 to 75 dBA. The Department of Public Health map also shows that noise levels decrease with distance from streets, so that the interiors of some city blocks are subject to lower noise levels (between 50 and 59 dBA L_{dn}). In addition, measured exterior noise exposure at a residential receiver in the vicinity of the Alameda–Contra Costa Transit District's (AC Transit) bus storage facility, on the southeast corner of Third Street and Stillman Street, was approximately 81 dBA L_{dn}.[2] The noise level at this location is higher than the typical downtown San Francisco noise level due to proximity to Interstate 80.

These noise levels for much of the project area are at the upper level considered acceptable by the City for residential and commercial/office uses (70 dB and 75 dB, respectively). Areas along Interstate 80 have ambient noise levels that exceed these desired thresholds and new development in these areas would require noise reduction measures.

Existing ambient noise levels along the Caltrain right-of-way between Hooper and Mariposa Streets include existing Caltrain, freight rail, other tenant railroads, and non-railroad ambient noise sources (vehicles on Interstate 280 and local vehicle traffic). Noise measurement data for ambient noise levels from the Caltrain electrification project provide the best available information for noise levels along representative points at the western and southern limits of the project study area and correspond to that of a typical urban setting. The average L_{dn} ranged from 64 dBA to 74 dBA depending on the measurement location (Peninsula Corridor Joint Powers Board 2014 and 2015).

[1] L_{dn} is a 24-hour metric based on 1-hour average noise levels (L_{eq}) with an adjustment to reflect the greater sensitivity of most people to nighttime noise. The adjustment is a 10-decibel (dBA) penalty for all sound that occurs in the nighttime hours of 10 p.m. to 7 a.m. The effect of the penalty is that in the calculation of L_{dn}, any event that occurs during the nighttime hours is equivalent to 10 of the same event during the daytime hours.

[2] Golden Gate Bridge Highway and Transportation District, Final 7th Addendum to the Transbay Terminal Joint Powers Authority Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Final Environmental Impact Statement/Environmental Impact Report for the Proposed Golden Gate Transit Mid-Day Bus Parking Facility Relocation Project, May 2013.



Sources: San Francisco Department of Public Health 2008; compiled by AECOM in 2015

Figure 3.12-1 Existing Traffic Noise

Mechanical sources of noise also contribute to existing ambient noise levels. Short-term noise sources such as truck back-up beepers, the crashing of material being loaded or unloaded, car doors slamming, and car engines starting up contribute very little to 24-hour noise levels, but are capable of sleep disturbances and severe annoyance. Stationary noise sources are often associated with heavy commercial and light industrial uses (i.e., commercial building contractors, wholesale distribution and trucking facilities, and processing facilities) that do not generally exist in the downtown San Francisco area, with the notable exception of the Transit Center.

The primary stationary noise sources in the proposed project area are mechanical (e.g., heating, ventilation, and air conditioning equipment) equipment on building roofs. In addition, the existing ambient noise environment directly near the proposed project includes temporary noise associated with Phase 1 construction activities.

Noise-Sensitive Receptors

Sensitive receptors are defined as land uses where the noise level is quiet because it is an essential element in their intended purpose, such as residences and buildings where people sleep, and institutional land uses with primarily daytime and evening uses. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would be considered noise- and vibration-sensitive receptors, and may warrant unique measures for protection from intruding noise. Residential towers often have windows or outdoor balconies that can expose residents to stationary-source noise levels. See Section 3.15 Parklands, Community Facilities and Services, Figure 3.15-1 for a detailed description of sensitive receptors near and within the proposed project area.

The FTA Transit Noise and Vibration Impact Assessment identifies three categories of sensitive land uses as described in Table 3.12-1. Non-sensitive uses do not require a noise impact assessment.

Table 3.12-1
FTA Noise-Sensitive Land Use Categories

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor Leq(h)/a	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor Leq(h)/a	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

Note:
[a] L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity
Source: FTA 2006

The FTA developed a screening procedure designed to identify where a project may cause a noise impact. Table 3.12-2 shows the screening criteria relevant to the proposed project. The screening distances in Table 3.12-2 focus on above-ground operational noise, and do not apply to subterranean sources of noise.

Table 3.12-2
Screening Distances for Noise Assessments

Type of Project	Screening Distance (feet)[a]	
	Unobstructed	Intervening Buildings
Parking Facilities	125	75
Ventilation Shafts	200	100
Park-and-Ride Lots with Buses	225	150

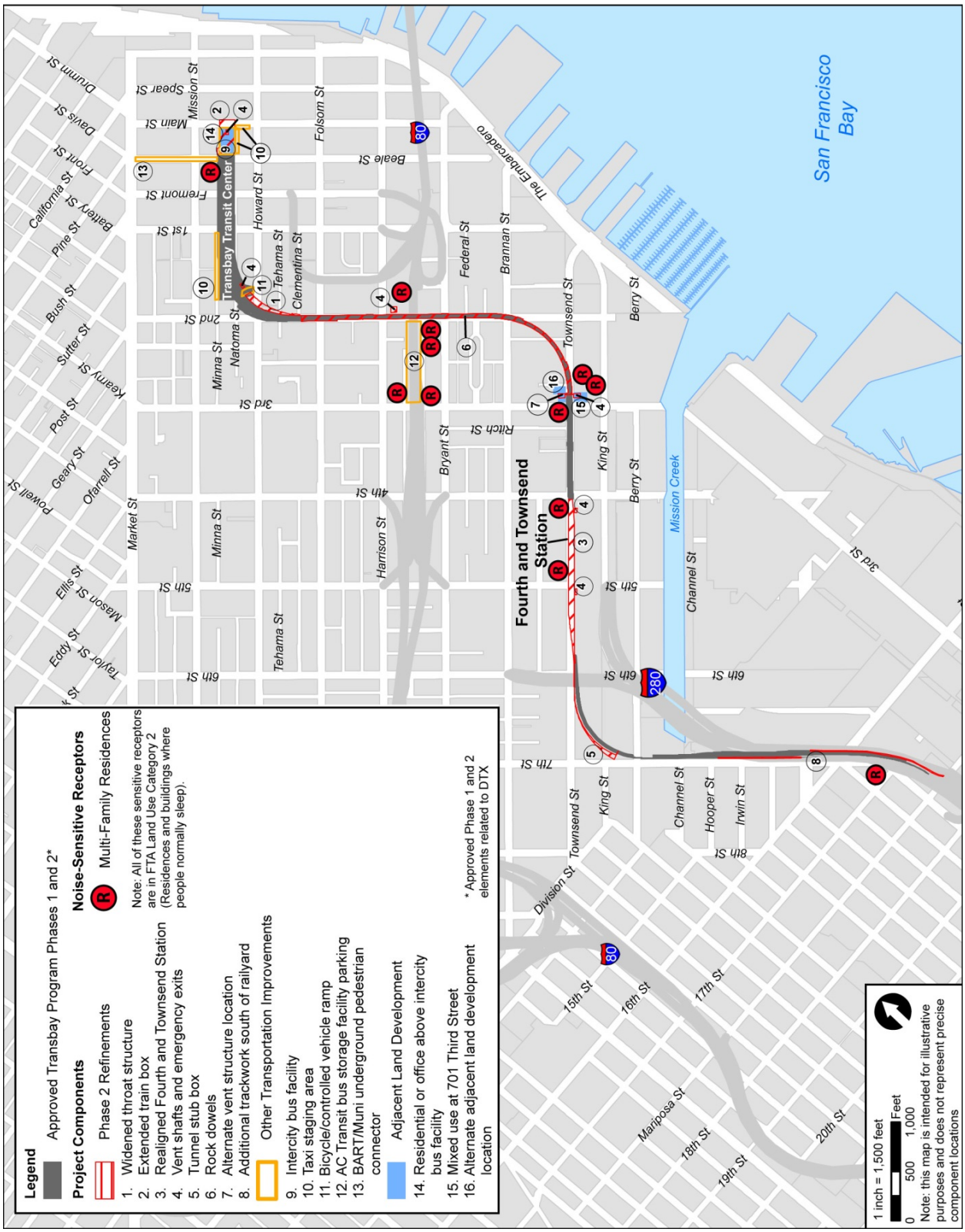
Note:
[a] Measured from the centerline of the noise-generating activity.
Source: FTA 2006

Based on the screening distances presented in Table 3.12-2 (see Table 4-1 of the FTA Noise Impact and Vibration Assessment guidelines [FTA 2006]), the following sensitive receptors in Table 3.12-3 (see also Figure 3.12-2) would potentially be affected by above-ground operational noise associated with the proposed project. All of these sensitive receptors are in FTA Land Use Category 2 (Residences and buildings where people normally sleep).

Table 3.12-3
Sensitive Land Use Receptors near the Proposed Project

Proposed Project Component	Sensitive Receptor	Distance
Intercity Bus Facility	• Millennium Tower at 301 Mission	114 feet
Taxi Staging Area	• Millennium Tower at 301 Mission Street	15 feet from the Beale Street staging area
Ventilation Structure at southwestern end of the Realigned Fourth and Townsend Street Station	• Residences at 695 Fifth Street	150 feet
Ventilation Structure at northeastern end of the Realigned Fourth and Townsend Street Station	• Residences at 310 Townsend Street	75 feet
Ventilation Structure at Third and Townsend Streets	• Residences at 188 King Street • Residences at 170 Third Street • The Beacon Residential Community • Residences at 200 Townsend Street	15 feet 15 feet 75 feet 100 feet
Vent Structure – Alternate location at northeast corner of Third and Townsend Streets	• Residences at 170 Third Street • Residences at 200 Townsend Street • The Beacon Residential Community	75 feet 75 feet 110 feet
Ventilation Structure at Second and Harrison Streets	• Residences at 575 Harrison Street	15 feet
Ventilation Structure at Eastern End of Transit Center	• Millennium Tower at 301 Mission Street	15 feet
AC Transit Bus Storage Facility	• Residences along 17-21, 31-35, 93-99 Stillman Street • Residences at 88 Perry Street	35 feet 35 feet
Additional trackwork south of the of the Caltrain Railyard	• Residences at 1050 17th Street	100 feet

Note:
This table only includes proposed project components that are at or above street level; other proposed project components would be underground and would not alter ambient noise levels that could affect sensitive land use receptors.
Source: Compiled by TAHA 2014 and AECOM 2015



Sources: Noise Sensitive Receptor data created by TAHA in 2014; compiled by AECOM in 2015

Noise sensitive residential receptors identified in this figure fall into FTA Land Use Category 2, as defined in Table 3.12-1 above.

Figure 3.12-2 Noise-Sensitive Receptors

Existing Vibration Levels

The majority of urban vibration is generated by buses and trucks. The proposed project area as it relates to sources of vibration remains largely unchanged from the conditions presented in the 2004 FEIS/EIR and current conditions. Vibration measurements presented in the 2004 FEIS/EIR indicate that the typical vibration levels in the project area range from 35 to 40 route mean square vibration velocity expressed in decibels (VdB). The normal threshold of human perception of vibration is approximately 65 VdB, and most people find levels up to 75 to 80 VdB acceptable for residential land uses as long as the vibration happens only intermittently. This indicates that existing ground-borne vibration in the study area is almost always below the threshold of human perception. In addition, the existing vibration environment directly near the proposed project includes vibration associated with Phase 1 construction activity.

Existing ambient vibration in the Caltrain corridor mainly is the result of vibration from Caltrain rail and freight rail service and, to a much lesser extent, from traffic on nearby streets (Peninsula Corridor Joint Powers Board 2014 and 2015). Measurements of existing vibration levels from the Caltrain electrification project provide the best available information for vibration levels along representative points at the western and southern project area limits. Ground vibration levels during Caltrain passbys (with observed speeds up to 79 mph) was measured up to 73 VdB at a distance of 50 feet from the track centerline (Peninsula Corridor Joint Powers Board 2014 and 2015). The measurements showed that vibration levels did not exhibit much attenuation with distance.

Vibration-Sensitive Receptors

Land uses sensitive to high vibration levels typically include buildings where vibration would interfere with operations (e.g., concert halls or hospitals), residences and buildings where people normally sleep, and institutional uses (e.g., schools, churches, and office buildings). Vibration related to the proposed project would generally be related to construction of the proposed project components. None of the components would be considered substantial vibration sources, such as a freight train or at-grade commuter rail service. The previously approved DTX alignment is located in an urban area of downtown San Francisco, and various land uses, including residences and office buildings, are located above the tracks. The widened throat structure, a proposed project component, would extend rail tracks under a portion of the 589 Howard Street and 171 Second Street and could introduce new vibration effects on these historic structures.

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning noise and vibration, including new guidance issued since the 2004 FEIS/EIR.

Federal

FTA Noise and Vibration Guidelines

All transit projects receiving federal transit funding must use the FTA's Noise Impact and Vibration Assessment (FTA 2006) to predict and assess potential noise and vibration impacts. The primary change associated with these updated guidelines since the 2004 FEIS/EIR is the extended incremental impact criteria to higher baseline ambient levels. As ambient levels increase, smaller and smaller increments of noise are recommended to limit community annoyance. This is because, in areas with high ambient noise, it takes a smaller increase in noise to attain the same percentage increase in human annoyance levels as a larger increase in noise in areas with low ambient noise. The FTA guidance includes screening distances, impact criteria, and calculation methodologies, all of which were used in this current analysis.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts related to noise and vibration, and to avoid or mitigate those impacts when feasible.

Local

The San Francisco Municipal Code contains noise limits in Police Code Article 29 (City of San Francisco 2008). Noise limits for various land-use categories that are applicable to the proposed project are as follows:

- Residential Property Noise Limits (Police Code Section 2090[a][2]). No person shall produce or allow to be produced a noise level more than 5 dBA above the ambient noise level.
- Public Property Noise Limits (Police Code Section 2909[b]). No person shall produce or allow to be produced a noise level more than 10 dBA above the local ambient noise level at a distance of 25 feet or more.
- Fixed Residential Interior Noise Limits (Police Code Section 2909[d]). To prevent sleep disturbance, protect public health, and prevent environment from progressive deterioration due to increasing use and influence of mechanical equipment, no fixed noise source may cause the noise level measured inside any dwelling unit to exceed 45 dBA between the hours of 10 p.m. and 7 a.m. or 55 dBA between the hours of 7 a.m. and 10 p.m. with windows open.

Section 2907(a) of the Police Code states that it is unlawful for any person to operate any powered construction equipment if the operation of such equipment emits a noise level higher than 80 dBA when measured at a distance of 100 feet from such equipment. This provision is not applicable to impact tools and equipment that have intake and exhaust mufflers recommended by the manufacturer, if approved by the Director of Public Works or the Director of Building Inspection (Police Code Section 2907[b]). Section 2908, Construction Work at Night, states that it is unlawful for any person to erect, construct, demolish, excavate, alter, or repair any building or structure between the hours of 8 p.m. of any day and 7 a.m. of the following day if the noise level created would result in the ambient noise level to increase by 5 dBA. An exemption to this guideline is possible if a special permit is applied for and granted by the Director of Public Works or the Director of Building Inspection.

3.12.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

Based on Appendix G of the State CEQA Guidelines, the proposed project would have an impact related to noise and vibration if it would do any of the following:

- expose people to or generate noise levels in excess of standards established in the San Francisco General Plan or noise ordinance (Article 29 of the San Francisco Municipal Code) or applicable standards of other agencies,
- expose people to or generate excessive ground-borne vibration or ground-borne noise levels,
- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, or

- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The FTA developed the Transit Noise and Vibration Impact Assessment (FTA 2006) for use in assessing potential impacts from transit systems and facilities. The quantitative criteria in the FTA document have been used to address the non-specific, unquantified State CEQA Guidelines thresholds presented above. Both the quantitative FTA guidelines and the City Municipal Code were used to assess the potential for impacts for the proposed project. The incremental noise impact criteria included in the FTA guidelines are based on U.S. Environmental Protection Agency recommendations and associated studies of annoyance in communities affected by transportation noise. The criteria reflect changes in noise exposure using a sliding scale, where the higher the level of existing noise, the smaller increase in total noise exposure is allowed. The noise impact criteria for transit projects are shown in Table 3.12-4 and distinguish among "no," "moderate," and "severe" impacts. The noise impact criteria are based on a comparison of the existing outdoor noise levels and the future outdoor noise levels from the proposed project. Under the no impact category, no change in noise level would occur. The moderate impact threshold defines areas where the change in noise is noticeable, but may not be sufficient to cause a strong, adverse community reaction. The severe impact threshold defines the noise limits above which a significant percentage of the population would be highly annoyed by new noise.

The vibration analysis considers two impact categories: (1) human annoyance and (2) building damage. Human annoyance criteria are generally used to access potential impacts associated with operational vibration, whereas building damage criteria are used to access vibration impacts associated with construction activities. Tables 3.12-5 and 3.12-6 list criteria for acceptable levels of ground-borne noise and vibration for various land-use categories. Passive recreation areas fall under Category 1. Residences and hotels fall under Category 2, which are places where people sleep. Schools and churches fall under Category 3, which are places where primary use occurs mainly during the day. In accordance with the FTA guidelines, the proposed project is classified under "Frequent Events," since the number of proposed operational events would exceed 70 per weekday.

The American Public Transit Association (APTA) has published design guidelines for Rapid Transit Facilities (APTA 1979). The design guidelines include standards for ancillary facilities such as ventilation shafts. The APTA-recommended noise level for ancillary facilities in high-density residential areas is 60 dBA.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the noise and vibration effects will be the same as those presented in Section 5.8 Noise and Vibration (pages 5-64 to 5-77) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects, plus Mitigation Measures NoiO 1 through 3, VibO 1, NoiC 1 through 6, and VibC 1 through 6, which were previously adopted and incorporated into the Transbay Program, are provided below. The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR.

Operational Noise and Vibration. The 2004 FEIS/EIR concluded that no noise impacts will occur related to train pass-by, vehicular traffic, or Caltrain railyard activity. However, a noise impact was identified related to the bus storage facility, and rail-related vibration impacts were identified at 388 Townsend Street, the Clocktower Building, a Second Street apartment building, and the Marriot Courtyard. Mitigation Measures NoiO 1 through NoiO 3 and VibO 1 were identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program to reduce operational impacts; these are summarized below. The full text of these measures is presented in Appendix C of this SEIS/EIR.

Table 3.12-4
Noise Levels Defining Impact for Transit Projects

Existing Noise Exposure L_{eq}(h) or L_{dn} (dBA)[a]	Project Noise Impact Exposure, L_{eq}(h) or L_{dn} (dBA)[a]					
	Category 1 or 2 Sites[b,c]			Category 3 Sites[d]		
	No Impact	Moderate Impact	Severe Impact	No Impact	Moderate Impact	Severe Impact
<43	< Ambient + 10	Ambient + 10 to 15	>Ambient + 15	< Ambient + 15	Ambient + 15 to 20	>Ambient + 20
43	<52	52–58	>58	<57	57–63	63
44	<52	52–58	>58	<57	57–63	63
45	<52	52–58	>58	<57	57–63	63
46	<53	53–59	>59	<58	58–64	64
47	<53	53–59	>59	<58	58–64	64
48	<53	53–59	>59	<58	58–64	64
49	<54	54–59	>59	<59	59–64	64
50	<54	54–59	>59	<59	59–64	64
51	<54	55–60	>60	<59	59–65	65
52	<55	55–60	>60	<60	60–65	65
53	<55	55–60	>60	<60	60–65	65
54	<55	55–61	>61	<60	60–66	66
55	<56	55–61	>61	<61	61–66	66
56	<56	56–62	>62	<61	61–67	67
57	<57	57–62	>62	<62	62–67	67
58	<57	57–62	>62	<62	62–67	67
59	<58	58–63	>63	<63	63–68	68
60	<58	58–63	>63	<63	63–68	68
61	<59	59–64	>64	<64	64–69	69
62	<59	59–64	>64	<64	64–69	69
63	<60	60–65	>65	<65	65–70	70
64	<61	61–65	>65	<66	66–70	70
65	<61	61–66	>66	<66	66–71	71
66	<62	62–67	>67	<67	67–72	72
67	<63	63–67	>67	<68	68–72	72
68	<63	63–68	>68	<68	68–73	73
69	<64	64–69	>69	<69	69–74	74
70	<65	65–69	>69	<70	70–74	74
71	<66	66–70	>70	<71	71–75	75
72	<66	66–71	>71	<71	71–76	76
73	<66	66–71	>71	<71	71–76	76
74	<66	66–72	>72	<71	71–77	77
75	<66	66–73	>73	<71	71–78	78
76	<66	66–74	>74	<71	71–79	79
77	<66	66–74	>74	<71	71–79	79
>77	<66	66–75	>75	<71	71–80	80

Table 3.12-4
Noise Levels Defining Impact for Transit Projects

Existing Noise Exposure L_{eq}(h) or L_{dn} (dBA)[a]	Project Noise Impact Exposure, L_{eq}(h) or L_{dn} (dBA)[a]					
	Category 1 or 2 Sites[b,c]			Category 3 Sites[d]		
	No Impact	Moderate Impact	Severe Impact	No Impact	Moderate Impact	Severe Impact

Notes: L_{eq} = noise-level equivalent; L_{dn} = day-night noise level; dBA = A-weighted decibel

[a] L_{dn} is used for land use where nighttime sensitivity is a factor; L_{eq} during the hour of maximum transit noise exposure is used for land use involving only daytime activities.

[b] Category 1 site include tracts of land where quiet is an essential element of their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.

[c] Category 2 sites include buildings where people normally sleep.

[d] Category 3 sites include institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities can also be in this category. Certain historic sites and parks are also included.

Source: FTA 2006

Table 3.12-5
Ground-borne Vibration and Noise Impact Criteria for Human Annoyance

Land Use Category	GBV Impact Levels (VdB in 1 micro-inch per second)			GBN Impact Levels (dB in 20 micro Pascals)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]	N/A[d]	N/A[d]	N/A[d]
Category 2: Residences and buildings where people normally sleep	72	75	80	35	38	43
Category 3: Institutional land uses with primarily daytime use	75	78	83	40	43	48

Notes:
dB = decibels; GBN = ground-borne noise; GBV = ground-borne vibration; VdB = vibration decibels

[a] "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.

[b] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.

[c] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

[d] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes.

Source: FTA 2006

Table 3.12-6
Construction Vibration Damage Criteria

Building Category	PPV (inches/second)	Approximate L_v [a]
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Notes:
L_V = vibration velocity level; PPV = peak particle velocity
[a] Route mean square velocity in decibels (VdB) re: 1 micro-inch per second
Source: FTA 2006

- **NoiO 1 –** apply noise mitigation at the following locations adjacent to the bus storage facility:
    - Provide sound insulation to mitigate noise impacts at the residences north of the AC Transit facility at the corner of Perry and Third Streets.
    - Construct noise barriers to mitigate noise impacts to residences south of the AC Transit facility along Stillman Street.
    - Construct a noise barrier to mitigate noise impacts to residences south of the Golden Gate Transit facility along Stillman Street.
- **NoiO 2 –** landscape the noise walls.
- **NoiO 3 –** construct noise walls prior to the development of the permanent bus facilities.
- **VibO 1 –** use high-resilience track fasteners or a resiliently supported tie system for the Caltrain Downtown Extension for areas projected to exceed vibration criteria, including the following locations: (1) Live/Work Condos, 388 Townsend Street (Hubbell and Seventh), (2) San Francisco Residences on Bryant (Harrison parking lot site), (3) Clock Tower Building and Second Street High Rise, and (4) new Marriott Courtyard (Marine Firefighter's Union).

Construction Noise and Vibration. The 2004 FEIS/EIR found that significant noise and vibration impacts will occur during construction without implementation of mitigation measures. The following summarized mitigation measures were identified to reduce adverse/significant impacts. The full text for the measures is contained in Appendix C of this SEIS/EIR.

- **NoiC 1 –** comply with the San Francisco noise ordinance. The noise ordinance includes specific limits on noise from construction. The basic requirements are as follows:
    - Maximum noise level from any piece of powered construction equipment is limited to 80 dBA at 100 feet.
    - Impact tools are exempted, although such equipment must be equipped with effective mufflers and shields.

- Construction activity is prohibited between 8 p.m. and 7 a.m. if it causes noise that exceeds the ambient noise plus 5 dBA.

- **NoiC 2 –** conduct noise monitoring to ensure that contractors take all reasonable steps to minimize noise.

- **NoiC 3 –** conduct inspections and noise testing of equipment to ensure that all equipment on the site is in good condition and effectively muffled.

- **NoiC 4 –** implement an active community liaison program to keep residents informed about construction plans so that they can plan around periods of particularly high noise levels, and to provide a conduit for residents to express complaints about noise.

- **NoiC 5 –** minimize use of vehicle backup alarms.

- **NoiC 6 –** include noise control requirements in construction specifications. These should require the contractor to do the following:

  - Perform all construction in a manner to minimize noise.

  - Use equipment with effective mufflers.

  - Perform construction in a manner to maintain noise levels at noise-sensitive land uses below specific limits.

  - Perform noise monitoring to demonstrate compliance with the noise limits. Independent noise monitoring shall be performed to check compliance in particularly sensitive areas.

  - Minimize construction activities during evening, nighttime, weekend, and holiday periods. Permits shall be required before construction can be performed in noise-sensitive areas during these periods.

  - Select haul routes that minimize intrusion to residential areas.

  Controlling noise in contractor work areas during nighttime hours is likely to require some mixture of the following approaches:

  - Restrictions on noise-producing activities during nighttime hours.

  - Laying out the site to keep noise-producing activities as far as possible from residences, minimizing the use of backup alarms, and minimizing truck activity and truck queuing near the residential areas.

  - Using procedures and equipment that produce lower noise levels than normal.

  - Using temporary barriers near noisy activities.

  - Using partial enclosures around noisy activities.

- **VibC 1 –** limit or prohibit use of construction techniques that create high vibration levels. At a minimum, processes such as pile driving shall be prohibited at distances less than 250 feet from residences.

- **VibC 2 –** restrict procedures that contractors can use in vibration-sensitive areas.
- **VibC 3 –** require vibration monitoring during vibration-intensive activities.
- **VibC 4 –** restrict the hours of vibration-intensive activities such as pile driving to weekdays during daytime hours.
- **VibC 5 –** investigate alternative construction methods and practices to reduce impacts in coordination with the construction contractor if resident annoyance from vibration becomes a problem.
- **VibC 6 –** include specific limits, practices, and monitoring and reporting procedures for the use of controlled detonation. Control and monitor use of controlled detonation to avoid damage to existing structures. Include specific limits, practices, and monitoring and reporting procedures within contract documents to ensure that such construction methods, if used, would not exceed safety criteria.

The 2004 FEIS/EIR concluded that the mitigation measures listed above will reduce potential noise and vibration impacts related to operational and construction activity. However, the current analysis takes into consideration that exterior construction activity (e.g., heavy-duty equipment and associated back-up alarms) will occur in the urban environment of downtown San Francisco and includes residential land uses, and has potential to increase ambient noise levels by 5 dBA or more. Therefore, No Action Alternative nighttime construction activity occurring between 8 p.m. and 7 a.m. has potential to result in adverse and significant and unavoidable impacts.

Proposed Project

Impact NO-1: The proposed project would not generate operational noise impacts after implementation of proposed mitigation to reduce noise from vent structures near residential uses. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

Subterranean Components. The following proposed project components would be subterranean and would not generate street-level noise and the potential to affect noise-sensitive land uses. No further noise analysis is necessary for the following:

- Widened throat structure
- Extended train box
- Realigned Fourth and Townsend Street Station
- Tunnel stub box
- Rock dowels
- Bicycle/controlled vehicle ramp and below-grade bicycle facilities
- Beale Street underground pedestrian connector

Additional Trackwork South of the Caltrain Railyard. Operations for the additional trackwork south of the Caltrain railyard would occur along Seventh Street, between approximately Hooper and Mariposa Streets within the existing Caltrain right-of-way. The noise study performed for the Caltrain electrification program based on FTA reference levels, reported an anticipated noise levels at operations of 79 mph would be between 68 and 69 dBA – these levels are within the range of existing noise levels along the Caltrain corridor (Peninsula Corridor Joint Powers Board 2014 and 2015). The train movements along the proposed project additional track would travel much more slowly, an estimated 15 mph, because these tracks are not intended for mainline service. At this speed, the noise level for rail operations associated with this proposed project component would be about 55 dBA, which is lower than existing

levels and, therefore, would not result in new operational noise impacts. This proposed project component would not generate an adverse effect/significant impact with respect to noise.

Intercity Bus Facility. The potential for noise impacts associated with the intercity bus facility were assessed based on FTA guidelines. The proposed intercity bus facility would be located approximately 114 feet from the Millennium Tower at 301 Mission Street, which is the closest residence. Based on FTA screening criteria, a detailed noise assessment has been conducted to assess the potential for a noise impact on this land use. The FTA requires that the potential impact on residential land uses be characterized using the 24-hour L_{dn} noise metric. Average hourly daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) bus volumes were calculated to estimate proposed-project-related L_{dn}. It is anticipated that hourly bus volumes at the intercity bus facility would average 2.7 during daytime hours and 1.3 during nighttime hours. The existing L_{dn} at Millennium Tower is approximately 70 dBA, and the L_{dn} associated with the intercity bus facility would be approximately 52 dBA. Based on these noise levels, the intercity bus facility would increase the L_{dn} at Millennium Tower by less than 1 dBA, which would not exceed FTA impact criteria. Therefore, the intercity bus facility would not generate an adverse/ significant impact for this nearby noise sensitive receptor.

Taxi Staging Area. Taxi pick-up/staging would occur at street level along the south side of Minna Street between First and Second Streets, along Natoma Street between Main and Beale Streets, and along the west side of Beale Street between Natoma and Howard Streets. At the pick-up/staging area, taxi noise is best characterized as low-speed vehicle travel and idling. Unlike a hotel taxi zone, the proposed taxi staging area would not typically include unusual or sudden sources of noise, such as bellhop whistles. In addition, the San Francisco taxi fleet is more than 90 percent hybrid or fueled with compressed natural gas, which generate less engine noise than traditional gasoline-powered taxis. According to California Department of Transportation guidance, traffic volumes typically need to double before resulting in an audible (3 dBA) increase in noise levels. It is not anticipated that the proposed project would double hourly or daily traffic volumes on Minna, Natoma, or Beale Streets. Therefore, taxi-related noise would not result in an audible increase relative to total traffic noise. This proposed project component would not generate an adverse effect or a significant impact with respect to noise.

Ventilation Shafts. Based on FTA screening criteria, the ventilation shafts may substantially increase ambient noise levels at adjacent residential uses. Potential noise associated with ventilation systems would include pass-by noise from trains transmitted through ventilation shafts to the street, normal fan operation, and testing of the emergency ventilation fans, which would include emergency generators associated with them. The emergency generators would typically be located on the roof and only used for a short duration during testing. Air/intake shaft mechanical equipment would be limited to a damper that opens whenever the tunnel ventilation fans operate and closes upon fan shutdown.

Without acoustic treatment or design, ventilation shaft noise levels would range from approximately 60 to 70 dBA at a distance of approximately 30 feet from the shaft gratings (Transportation Research Board 1997). At properties adjacent to the ventilation shafts, noise levels would exceed the APTA recommended noise levels of 60 dBA for high-density residential areas. Without New-MM-NO-1.1, this proposed project component could result in an adverse/significant noise impact.

Mitigation Measure. New-MM-NO-1.1 would ensure that ventilation shaft noise levels do not exceed the APTA recommended noise level of 60 dBA for ancillary facilities in high-density residential areas and, thereby, reduce an adverse effect/significant impact to a less-than-significant level.

New-MM-NO-1.1 Design Ventilation Shaft to Avoid Noise Effects on Nearby Uses. Ventilation shafts shall be designed in accordance with the APTA guidance for controlling noise, which includes a 60 dBA noise level at 50 feet from the

facility, at the setback line of the nearest building, or at the nearest occupied area, whichever is nearest to the source. Treatments may include applying acoustical absorption materials to shaft surfaces or attaching silencers to fans.

AC Transit Bus Storage Facility Parking. Under the proposed project, the AC Transit facility is proposed to be used by the general public for off hours, nighttime, or event parking (e.g., nighttime sporting or special events) when not in use by AC Transit for regular operations. The AC Transit bus storage facility would have two potential modes of parking: 202 valet-parked spaces or 167 self-parked spaces.

The 2004 FEIS/EIR Mitigation Monitoring and Reporting Program included three mitigation measures (NoiO 1 through NoiO 3) specifically to reduce impacts associated with the AC Transit bus storage facility. These mitigation measures are described above and include noise barriers along Stillman Street and sound insulation on the southern face of the AC Transit bus storage facility. The analysis determined that the mitigation measures would reduce impacts associated with the bus facility for neighboring residents.

The nearest residential land use is located approximately 70 feet from the AC Transit bus storage facility, and, based on the FTA screening criteria, may be affected by parking activity. An analysis was completed using a spreadsheet from the FTA guidelines and the recommended 24-hour L_{dn} noise metric. The FTA spreadsheet requires existing noise, average daytime and nighttime automobile activity, and average daytime and nighttime bus activity. This is a conservative analysis, because the proposed project would not generate new bus noise. It was further assumed that the average 15-hour daily daytime activity (i.e., 7 a.m. to 10 p.m.) would include 22 automobiles (334/15) and five buses (73/15) per hour. It is anticipated that while valet activity would be spread throughout the night hours, it is possible that all 167 self-parking spaces could be accessed in 1 hour. Therefore, the average 9-hour nighttime activity (i.e., 10 p.m. to 7 a.m.) was assumed to include 37 automobiles (334/9) per hour and three buses per hour.

Using these assumptions, the project-related L_{dn} would be 36 dBA. The measured exterior noise exposure at a residential receiver location in the vicinity of the AC Transit bus storage facility on the southeast corner of Third Street and Stillman Street was approximately 81 dBA L_{dn} (Golden Gate Bridge Highway and Transportation District 2013). The proposed project-related mobile noise increase would be well below the FTA impact criteria listed in Table 3.12-4 and existing noise levels. Parking activity would be likely to generate "instantaneous" noise events, such as car alarms, horns, and door slams. In addition, multiple vehicles arriving or departing over a 1-hour period would generate noise. However, because the parking area would be located underneath Interstate 80, and the existing noise levels exceed 80 dBA L_{dn}, it is not anticipated that instantaneous or incremental noise would be audible over the steady noise generated by the freeway. Therefore, this proposed project component would not generate an adverse/ significant impact related to noise.

Impact NO-2: The proposed project would not generate operational vibration impacts. (No Adverse Effect/Less-than-Significant Impact)

The greatest potential for increased vibration from the proposed project would be associated with the widened throat structure and extended train box, both designed to accommodate high-speed trains. Although high-speed train service would increase the total number of daily train movements (inbound and outbound), the number of movements would remain within the threshold category analyzed in the 2004 FEIS/EIR (i.e., "frequent"). Although the level of service proposed for Caltrain would remain essentially unchanged, at 132 train movements per weekday, the total number of train movements per day would increase to as many as 196 for conventional and high-speed train service combined. The California High-Speed Rail Authority's 2014 Business Plan indicates that daily high-speed train service to the Transit

Center would occur over a 16-hour period. The ground-borne noise and vibration velocity level metrics used to assess impacts were calculated (measured or predicted) as the maximum vibration velocity level per event, and were not based on the number of events or movements per day. The impact criteria threshold level values shown in Table 3.12-5 were applied based on the number of events per day ("infrequent" is fewer than 30 events per day, "occasional" is between 30 and 70, and "frequent" is more than 70 events per day).

Because the 2004 FEIS/EIR analysis assumed a "frequent" number of events (70 events per day or greater) in the analysis of ground-borne noise and vibration impacts, the same threshold would apply to the analysis with additional high-speed train movements. Because vehicle speeds would be similar for both conventional trains and high-speed trains in the Transit Center area, the majority of land uses along the alignment would not experience a change in the level of vibration events, and no new impacts would occur from the proposed project, except as described below.

Little to no potential vibration impact associated with operations for the additional trackwork south of the Caltrain railyard would occur. Train movement associated with the turnback track and maintenance of way (MOW) storage track along Seventh Street would include approximately six slow-moving train movements per day, compared to the projected 70 mainline commuter train passbys per day described above. Noise studies performed for the Caltrain electrification program based on FTA vibration reference levels reported that anticipated vibration levels at operations of 50 and 79 mph would be 73 VdB and 77 VdB at 50 feet from the outermost track, respectively—these levels are within the range of existing vibration levels along the Caltrain corridor (Peninsula Corridor Joint Powers Board 2014 and 2015). Trains moving along the proposed additional trackwork would travel at an estimated speed of 15 mph. At this speed, the vibration level for operations associated with the turnback track and MOW storage track would be about 63 VdB, which is lower than existing levels and, therefore, would not result in new vibration impacts.

The exceptions to a new potential vibration impact are associated with the historic structures at 589 Howard Street and 171 Second Street. The widened throat structure would extend rail tracks underneath these historic buildings. It is anticipated that operating speeds of trains would be 22 miles per hour at a depth of 60 to 65 feet. Using the FTA guidelines, anticipated vibration levels were compared to the impact criteria listed in Table 3.12-6 for building damage and Table 3.12-5 for interference with business activities (i.e., annoyance). The applicable impact criterion for building damage is 90 VdB. The applicable impact criteria related to annoyance of office/commercial use is 75 VdB for ground-borne vibration and 40 dBA for ground-borne noise. It is anticipated that operational ground-borne vibration and noise levels would be approximately 70 VdB and 35 dBA, respectively, at the basement of 589 Howard Street and building foundations for 171 Second Street. These levels would be less than the damage and annoyance impact criteria established by the FTA for historic structures and office/ commercial uses. Rubber-tired vehicles rarely generate perceptible vibration. The intercity bus facility would have a number of buses using the facility, but they would not be a substantial vibration source. The other proposed project components would also not be substantial sources of vibration (e.g., ventilation structures and taxi staging area).

Impact C-NO-3: The proposed project could result in construction noise impacts, if a waiver is issued by the City that would permit nighttime construction to occur. (Adverse Effect/Significant and Unavoidable Impact)

Construction of the proposed project would result in temporary increases in ambient noise levels in the project area on an intermittent basis. Noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers.

Construction activities require the use of noise-generating equipment. Typical noise levels from various types of equipment that may be used during construction are listed in Table 3.12-7. The table shows noise levels at distances of 50 and 100 feet from the construction noise source. At 50 feet, noise levels would typically range from approximately 74 dBA to 85 dBA.

Table 3.12-7
Typical Noise Levels from Construction Equipment

Noise Source	Noise Level (dBA)	
	50 Feet	100 Feet
Air Compressor	81	75
Back Hoe	80	74
Compactor	82	76
Concrete Mixer	85	79
Concrete Pump	82	76
Crane Mobile	83	77
Drill Rig Truck	79	76
Dump Truck	84	78
Generator	81	75
Paver	77	71
Roller	74	68
Saw	76	70
Source: FTA 2006		

The construction activity locations and processes, and the type of construction equipment used, would not change significantly from the assumptions used in the 2004 FEIS/EIR as a result of the proposed project components. Similar to the analysis presented in the 2004 FEIS/EIR, construction activity near the Transit Center potentially would impact adjacent land uses. Mitigation Measures NoiC 1 through NoiC 6, which were adopted and incorporated into the Transbay Program, would continue to apply and would reduce impacts from the proposed project construction.

New areas of construction activity would include those related to vent structures at the Fourth and Townsend Street Station, at Third and Townsend Streets, and at Second and Harrison Streets. The adjacent land development at the intercity bus facility and at the vent structures at Third and Townsend Streets and at Second and Harrison Streets also would result in additional construction noise and vibration. Construction activity at these locations typically would include demolition, excavation, and foundation and structure construction. Noise levels associated with these activities would not differ substantially from the typical noise levels generated by construction activity at the Transit Center and along the DTX. Certain construction activities (e.g., demolition) would be likely to generate noise levels that would exceed the City standard of 80 dBA at 100 feet without mitigation. Mitigation Measures NoiC 1 through NoiC 6, which were adopted and incorporated into the Transbay Program, would continue to apply to construction activity for the proposed project and, similar to the 2004 FEIS/FEIR, would reduce impacts from construction noise at new construction sites.

Regarding nighttime construction, Mitigation Measure NoiC 1, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would continue to apply and would be implemented and monitored for the proposed project. Consistent with the San Francisco noise ordinance, this mitigation measure prohibits construction activity between 8 p.m. and 7 a.m. if it causes

noise that exceeds the ambient noise plus 5 dBA. Occasions may occur when nighttime construction is desirable (e.g., lane restriping in commercial districts where nighttime construction would be less disruptive to businesses in the area) or necessary to avoid unacceptable traffic disruptions. Nighttime construction is not prohibited, and such activity would include equipment and associated back-up alarms. Nighttime construction that could occur in the urban environment, such as the proposed project area that includes residential land uses, potentially would increase ambient noise levels by 5 dBA or more and would be considered a potentially adverse effect/significant and unavoidable impact.

Impact C-NO-4: The proposed project could result in construction vibration impacts, but this potential effect would be avoided by proposed preconstruction mitigation. (No Adverse Effect/Less-than-Significant with Mitigation)

Vibration levels generated by construction equipment associated with the proposed project were obtained from the FTA Noise and Vibration Assessment, and are shown in Table 3.12-8. Calculations were performed to determine the distances at which vibration impacts would occur according to the FTA building category criteria. Table 3.12-8 also shows the results of those calculations as classified per building category as described in Table 3.12-5, above. The distances shown are the maximum distances at which short-term construction vibration impacts may occur according to the FTA Noise and Vibration Assessment. Distances from the proposed construction activity to the nearest buildings were measured for use in the analysis. It is not anticipated that construction activity would operate within the distances shown in Table 3.12-8, except in relation to the 589 Howard Street and 171 Second Street buildings. Mitigation Measures VibC 1 through VibC 6, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would continue to apply and would be implemented and monitored for the proposed project. These mitigation measures would help eliminate potential vibration impacts at all buildings except for 589 Howard Street and 171 Second Street (see new mitigation measure, below), and no further mitigation would be needed for general construction activity.

Table 3.12-8
Vibration Velocities for Construction Equipment

Equipment	Peak Particle Velocity at 25 Feet (Inches per Second)	Impact Distance for Building Category (Feet)		
		I	II	III
Large Bulldozer	0.089	7	11	14
Caisson Drilling	0.089	7	11	14
Loaded Trucks	0.076	7	10	14
Jackhammer	0.035	4	6	8
Small Bulldozer	0.003	1	1	2

Source: FTA 2006

The historic building on the property located at 589 Howard Street is a five-story structure with a one-story basement; and the historic building at 171 Second Street is a six-story structure. The widened throat structure would pass under both buildings, and the construction process would include installing two large-diameter piles under the buildings, and an underpinning beam spanning the piles. The piles and the beam would support the buildings while cut-and-cover construction occurs below. It is anticipated that construction activities have the potential to generate vibration levels that exceed the FTA impact criteria based on the proximity of the building to construction equipment and the type of heavy-duty equipment anticipated to be necessary to complete the underpinning. Without mitigation, this proposed project component could generate an adverse effect/significant impact related to construction vibration.

Mitigation Measure. New-MM-C-NO-4.1 would reduce construction vibration impacts on the historic buildings at 589 Howard Street and 171 Second Street and enable the buildings to retain their integrity and listing on the National Register of Historic Places.

New-MM-C-NO-4.1 *Protect 589 Howard Street and 171 Second Street Historic Buildings from Construction Impacts*. Prior to commencement of construction activity, a qualified structural engineer licensed in California with demonstrated experience with historic buildings and the application of the Secretary of the Interior's Standards for the Treatment of Historic Properties shall survey the existing foundation and other structural aspects of the 589 Howard Street and 171 Second buildings (subject to property owner granting access to conduct the survey). The qualified structural engineer shall submit a pre-construction survey letter establishing baseline conditions at each of the historic buildings. These baseline conditions shall be forwarded to the TJPA and to the mitigation monitor prior to issuance of any building permits. The survey shall also provide a shoring design to protect the structural integrity of the buildings at 589 Howard Street and 171 Second Street from potential damage. At the conclusion of vibration-causing activities, the qualified structural engineer shall conduct a comprehensive survey of the buildings to assess post-construction conditions and issue a follow-up letter describing structural or cosmetic damage, if any, to the historic buildings. The letter shall include recommendations for any repair, as may be necessary, in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Repairs shall be undertaken and completed in conformance with all applicable codes, including the California Historical Building Code (Part 8 of Title 24).

Cumulative Analysis

Impact CU-NO-5: The proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative noise or vibration impacts. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

The geographic scope of this analysis is defined as the area within the Transbay Program area, Transit Center District Plan area, and Central SoMa Plan area because the cumulative noise and vibration impacts would be mostly evident in the vicinity of the proposed project.

Operations. The operational analysis presented in this section assesses future noise and vibration levels in addition to existing conditions. The analysis considers cumulative conditions, including full rail operations and traffic generated by ambient growth and related projects. On a broad scale, the DTX and the proposed project would reduce cumulative noise levels by removing passenger vehicles from regional roadways and by encouraging transit use, bicycle riding, and walking. Vibration is a localized effect that typically does not result in cumulative impacts. The proposed project would not be a significant source of vibration, and no related projects have been identified that would combine with the proposed project to generate significant vibration impacts. Therefore, cumulative effects would not be adverse under NEPA and would be less than significant under CEQA.

Construction. The Transbay Program, Transit Center District Plan, and Central SoMa Plan areas already experience ongoing construction activities that contribute to noise and vibration impacts in the vicinity of the proposed project. Mitigation measures are required for construction projects in these areas.

The proposed project would involve construction activities that would result in noise and vibration effects that would be managed and limited through Mitigation Measures NoiO 1 through 3, VibO 1, NoiC 1 through 6, and VibC 1 through 6 previously adopted and incorporated into the Transbay Program, and New-MM-C-NO-4.1. It is likely that multiple projects would be under construction at the same time in the proposed project area, but construction would typically occur during daytime hours or with the addition of noise-control measures to stay within required noise limits, and would be temporary. Because construction would typically occur during daytime hours and remain within required limits, cumulative effects would not be adverse under NEPA and would be less than significant under CEQA.

3.12.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Noise and Vibration (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that although the potential would exist for construction and operational noise and vibration effects in the project area, no adverse effect would occur with mitigation. The proposed project analyzed in this SEIS/EIR would result in an adverse operational noise and construction-related vibration effects. However, with implementation of New-MM-NO-1.1 and New-MM-C-NO-4.1, in addition to Mitigation Measures NoiC 1 through 6, VibO 1, and VibC 1 through 6 previously adopted as part of the 2004 FEIS/EIR and incorporated into the Transbay Project, these effects would be reduced and would not be adverse. The proposed project analyzed in this SEIS/EIR would also result in a new adverse effect not identified in the 2004 FEIS/EIR related to nighttime construction noise if the City issues a waiver to allow construction at nighttime. Mitigation Measures NoiC 1 through NoiC 6 identified in the 2004 FEIS/EIR and previously adopted and incorporated into the Program would continue to apply and would reduce potential noise effects from proposed project construction activities. However, nighttime construction activity occurring between 8 p.m. and 7 a.m. would have the potential to remain an adverse effect. Although nighttime construction could remain adverse, it would only occur after the City has determined that such construction activity is permissible. Because of the temporary nature of construction and the inclusion of best management practices to effectively reduce construction noise and vibration, the overall effect would not be adverse with mitigation.
CEQA Summary	
Impact NO-1: Operational Noise (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that an operational noise impact would occur related to the bus storage facility; however, with Mitigation Measures NoiO 1 through NoiO 3, previously adopted and incorporated into the Transbay Program, the impact would be less than significant. The proposed project analyzed in this SEIS/EIR would result in a significant operational noise impact related to ventilation shafts. New-MM-NO-1.1 would ensure that ventilation shaft noise levels do not exceed the APTA-recommended noise level of 60 dBA in high-density residential areas. Therefore, the proposed project with the proposed mitigation would not result in new significant impacts or change the significance conclusions in the 2004 FEIS/EIR.
Impact NO-2: Operational Vibration (Less than Significant)	The 2004 FEIS/EIR identified rail-related vibration impacts at several properties. With implementation of Mitigation Measure VibO 1 previously adopted and incorporated into the Transbay Program, the 2004 FEIS/EIR concluded the Transbay Program would not result in a significant impact related to operational vibration and ground-borne noise. The proposed project analyzed in this SEIS/EIR would have less-than-significant impacts in terms of operational vibration. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond Mitigation Measure VibO 1 adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program would be required for the proposed project.

Impact C-NO-3: Construction – Noise (Significant and Unavoidable)	The 2004 FEIS/EIR concluded that construction-related noise within the project area potentially would affect adjacent land uses; however, with mitigation, construction noise would be less than significant. The proposed project analyzed in this SEIS/EIR would result in a new significant impact not identified in the 2004 FEIS/EIR related to nighttime construction noise, if the City issues a waiver to allow construction at nighttime. Mitigation Measures NoiC 1 through NoiC 6, identified in the 2004 FEIS/EIR and previously adopted and incorporated into the Transbay Program, would continue to apply and would reduce potential noise impacts from the proposed project construction activities. However, nighttime construction activities occurring between 8 p.m. and 7 a.m. would have the potential to result in a significant and unavoidable impact.
Impact C-NO-4: Construction – Vibration (Less than Significant with Mitigation)	The 2004 FEIS/EIR indicated that cut-and-cover construction and tunneling equipment would result in vibration impacts; however, with mitigation, construction vibration would be less than significant. The proposed project analyzed in this SEIS/EIR would result in a significant construction vibration impact on the 589 Howard Street and 171 Second Street buildings. New-MM-C-NO-4.1, in combination with Mitigation Measures VibC 1 through VibC 6 identified in the 2004 FEIS/EIR and previously adopted and incorporated into the Program, would minimize vibration at these buildings, and damage, if any, would be repaired in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. With implementation of new and previous adopted mitigation, this impact would be less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the impact determination in the 2004 FEIS/EIR.
Impact CU-NO-5: Cumulative – Noise and Vibration (Less than Significant with Mitigation)	The proposed project in combination with other reasonably foreseeable development would not change the cumulative determination for the 2004 FEIS/EIR. With implementation of New-MM-C-NO-4.1, the cumulative impacts of the proposed project would be less than significant.

3.13 AIR QUALITY

3.13.1 Introduction

This section describes existing air quality conditions and applicable regulations and plans governing the attainment of federal and state ambient air quality standards. The NEPA analysis includes a discussion of the proposed project's regional construction and operational emissions, along with U.S. Environmental Protection Agency (EPA) Transportation Conformity Guidance. The CEQA analysis includes a discussion of the proposed project's construction and operational emissions, toxic air contaminants, and its consistency with air quality plans. In particular, this analysis focuses on proposed project components and whether air quality conditions or regulations have changed since approval of the 2004 FEIS/EIR.

3.13.2 Affected Environment

Meteorology

The proposed project is located within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays that formulate local meteorology. During the summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Generally in the winter, the Pacific high weakens and shifts southward, winds tend to flow offshore, upwelling ceases, and storms occur.

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. This results in an average wind speed of approximately 20 miles per hour (from 3 p.m. to 4 p.m.) at the San Francisco International Airport. The annual average temperature in the proposed project area is approximately 57 degrees Fahrenheit (°F). Total precipitation in the project area averages approximately 21 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer.

Ambient Air Quality Data

The greatest source of air pollutant emissions in the proposed project area is from motor vehicle congestion, but because of the city's low-lying topography, constant marine air movement typically disperses these emissions. Existing air quality conditions in the study area are described based on measurements taken at the nearest Bay Area Air Quality Management District (BAAQMD) monitoring station, which, for the proposed project, is the Arkansas Street monitoring station. Table 3.13-1 shows the ambient air pollutant concentrations measured data during the last 5 years at the Arkansas Street monitoring station. The table lists federal and state ambient air quality standards for these pollutants, and where these pollutant standards have been exceeded. Table 3.13-1 also shows a side-by-side comparison of the recorded monitoring values from the 2004 FEIS/EIR, which presented data for 1996 through 2000, and the updated values for 2004 through 2012. The number of days that violated the air quality standards is similar, as shown for the two time periods. However, in general, criteria pollutant concentrations trended down or were steady from the time of the 2004 FEIS/EIR to current existing conditions, indicating overall improvement in local air quality.

Table 3.13-1
Summary of Pollutant Monitoring Data at San Francisco-Arkansas Monitoring Station

Pollutant	2004 FEIS/EIR					SEIS/EIR (January 2014)				
	Federal Standard	California Standard	Year	Maximum Level	Violation Days	Federal Standard	California Standard	Year	Maximum Level	Violation Days
Ozone (O_3) 1 hour	0.012 ppm	0.09 ppm	1996 1997 1998 1999 2000	0.07 ppm 0.07 ppm 0.05 ppm 0.08 ppm 0.06 ppm	0/0 0/0 0/0 0/0 0/0	---[1]	0.09 ppm	2004 2005 2006 2007 2008 2009 2010 2011 2012	0.093 ppm 0.058 ppm 0.053 ppm 0.060 ppm 0.082 ppm 0.072 ppm 0.079 ppm 0.070 ppm 0.069 ppm	0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0
Ozone (O_3) 8 hour	0.08 ppm	---	1996 1997 1998 1999 2000	0.050 0.059 0.046 0.057 0.044	0/0 0/0 0/0 0/0 0/0	0.075 ppm	0.070 ppm	2004 2005 2006 2007 2008 2009 2010 2011 2012	0.059 0.054 0.046 0.053 0.066 0.056 0.051 0.054 0.048	0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0
Respirable Particulate Matter (PM_{10}) 24 hour	150 µg/m³	50 µg/m³	1996 1997 1998 1999 2000	70.9 µg/m³ 81.0 µg/m³ 52.4 µg/m³ 77.9 µg/m³ 63.2 µg/m³	0/22/0 0/33/0 0/11/0 0/66/0 0/22/0	150 µg/m³	---	2004 2005 2006 2007 2008 2009 2010 2011 2012	51.4 µg/m³ 46.4 µg/m³ 61.4 µg/m³ 69.8 µg/m³ 41.3 µg/m³ 36.0 µg/m³ 39.7 µg/m³ 45.6 µg/m³ 50.6 µg/m³	0/11/0 0/0 0/33/0 0/22/0 0/0 0/0 0/**/0 0/0 0/66/0

Table 3.13-1
Summary of Pollutant Monitoring Data at San Francisco-Arkansas Monitoring Station

Pollutant	2004 FEIS/EIR					SEIS/EIR (January 2014)				
	Federal Standard	California Standard	Year	Maximum Level	Violation Days	Federal Standard	California Standard	Year	Maximum Level	Violation Days
Fine Particulate Matter ($PM_{2.5}$) 24 hour	65 µg/m³	---	1996 1997 1998 1999 2000	--- --- --- 71.2 µg/m³ 47.9 µg/m³	--- --- --- 15 [2] 6 [2]	35 µg/m³	---	2004 2005 2006 2007 2008 2009 2010 2011 2012	54.9 µg/m³ 44.2 µg/m³ 54.3 µg/m³ 45.2 µg/m³ 39.2 µg/m³ 49.8 µg/m³ 45.3 µg/m³ 47.5 µg/m³ 35.7 µg/m³	4 [2] 6 [2] 3 [2] 5 [2] 0 [2] 1 [2] 3 [2] 2 [2] 1 [2]
Carbon Monoxide (CO) 8 hour	9 ppm	9.0 ppm	1996 1997 1998 1999 2000	3.8 ppm 3.5 ppm 4.0 ppm 3.7 ppm 3.2 ppm	0/0 0/0 0/0 0/0 0/0	9 ppm	9.0 ppm	2004 2005 2006 2007 2008 2009 2010 2011 2012	2.21 ppm 2.09 ppm 2.09 ppm 1.60 ppm 2.29 ppm 2.86 ppm 1.37 ppm 1.20 ppm 1.19 ppm	0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0
Nitrogen Oxides (NO_2) 1 hour	---	0.25 ppm	1996 1997 1998 1999 2000	0.08 ppm 0.07 ppm 0.08 ppm 0.10 ppm 0.07 ppm	0/0 0/0 0/0 0/0 0/0	100 ppb	0.18 ppm	2004 2005 2006 2007 2008 2009 2010 2011 2012	0.063 ppm 0.066 ppm 0.107 ppm 0.069 ppm 0.062 ppm 0.059 ppm 0.093 ppm 0.093 ppm 0.124 ppm	0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/11/0

Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; ppb = parts per billion
[1] The federal 1-hour ozone standard was revoked in 2005.
[2] Value indicates measured days violating the standard.
Sources: CARB 2014a; FTA 2004

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. The BAAQMD generally defines a sensitive receptor as a facility or land use that houses or attracts three sectors of the population that are particularly sensitive to the effects of air pollutants—children, the elderly, and people with illnesses. Examples of sensitive receptors include residential areas, schools, and hospitals (BAAQMD 2011). The Millennium Tower is the nearest residential land use to the proposed project and represents the land use with the greatest potential to be affected. Additional sensitive receptors near the proposed project include, but are not limited to, PG&E Childcare Facility located within the PG&E corporate headquarters at 77 Beale Street, Marin Day Schools Spear Street located at 220 Spear Street, and Healthy Environments Child Development Center located at 75 Hawthorne Street. See Section 3.15, Public Services, Community Services, and Recreational Facilities and Figure 3.15-1 for a detailed discussion of non-residential sensitive receptors near and within the proposed project area.

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning air quality, including new guidance issued since the 2004 FEIS/EIR. Greenhouse gas is discussed in Section 3.14, Greenhouse Gases and Climate Change.

Federal

National Ambient Air Quality Standards and Attainment Status

The federal Clean Air Act (CAA) governs air quality in the United States, and includes National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. Table 3.13-2 shows a side-by-side comparison of the NAAQS presented in the 2004 FEIS/EIR and current standards. The following changes have been made to the NAAQS:

- An 8-hour ozone (O_3) standard of 0.075 parts per million (ppm) has been established.
- The 1-hour O_3 standard was revoked by EPA on June 15, 2005.
- A 1-hour nitrogen dioxide (NO_2) standard of 0.1 ppm has been established.
- A 1-hour sulfur dioxide (SO_2) standard of 0.075 ppm has been established. The 24-hour and annual SO_2 standards have been revoked.
- The annual respirable particulate matter (PM_{10}) standard was revoked.
- The 24-hour fine particulate matter ($PM_{2.5}$) standard was lowered from 65 to 35 micrograms per cubic meter ($\mu g/m^3$).

The CAA requires EPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The 2004 FEIS/EIR identified the SFBAAB as a nonattainment area for O_3 and unclassified for $PM_{2.5}$ and 24-hour PM_{10}. The SFBAAB is currently a nonattainment area for O_3 and an attainment area for the 24-hour PM_{10} standard. Table 3.13-3 compares attainment status designations.

Table 3.13-2
National and California Ambient Air Quality Standards

Pollutant	2004 FEIS/EIR			SEIS/EIR		
	Averaging Time	**National Standard**	**California Standard**	**Averaging Time**	**National Standard**	**California Standard**
Ozone (O_3)	1-hour 8-hour	0.12 ppm 0.08 ppm	0.09 ppm --	1-hour 8-hour	--- 0.075 ppm	0.09 ppm 0.07 ppm
Carbon Monoxide (CO)	1-hour 8-hour	35 ppm 9 ppm	20 ppm 9.0 ppm	1-hour 8-hour	35 ppm 9 ppm	20 ppm 9.0 ppm
Nitrogen Dioxide (NO_2)	1-hour Annual	--- 0.053 ppm	0.25 ppm ---	1-hour Annual	0.1 ppm 0.053 ppm	0.18 ppm 0.030 ppm
Sulfur Dioxide (SO_2)	1-hour 24-hour Annual	--- 365 µg/m^3 80 µg/m^3	0.25 ppm 0.04 ppm ---	1-hour 24-hour Annual	0.075 ppm --- ---	0.25 ppm 0.04 ppm ---
Respirable Particulate Matter (PM_{10})	24-hour Annual	150 µg/m^3 50 µg/m^3	50 µg/m^3 30 µg/m^3	24-hour Annual	150 µg/m^3 ---	50 µg/m^3 20 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	24-hour Annual	65 µg/m^3 15 µg/m^3	--- ---	24-hour Annual	35 µg/m^3 15 µg/m^3	--- 12 µg/m^3

Note:
ppm = parts per million; µg/m^3 = micrograms per cubic meter
Sources: CARB 2013; FTA 2004

Table 3.13-3
Federal and State Attainment Status for the Bay Area

Pollutant	Federal Status	California Status	Change Since 2004 FEIS/EIR
Ozone (O_3)	Nonattainment	Nonattainment	Federal – No change State – No change
Respirable Particulate Matter (PM_{10})	Attainment	Nonattainment	Federal – Changed from unclassified to attainment State – No change
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment	Nonattainment	Federal – Changed from unclassified to nonattainment State – Changed from no standard to nonattainment
Carbon Monoxide (CO)	Attainment	Attainment	No change
Nitrogen Dioxide (NO_2)	Attainment	Attainment	No change
Sulfur Dioxide (SO_2)	Attainment	Attainment	No change

Sources: CARB 2014b; FTA 2004

On January 9, 2013, EPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. This 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 action, the Bay Area will continue to be designated as nonattainment for the 24-hour $PM_{2.5}$ standard until the BAAQMD submits a "redesignation request" and a "maintenance plan" to EPA, and EPA approves the proposed redesignation.

On November 25, 2014, EPA proposed to strengthen the NAAQS for O_3, based on extensive scientific evidence about O_3 health effects. The proposed updates will improve public health protection, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma. EPA is proposing

to revise the primary standard to a level within the range of 0.065 to 0.070 ppm, and to revise the secondary standard to within the range of 0.065 to 0.070 ppm. As of the release of this SEIS/EIR, there has been no action to approve the proposed rule.

Transportation Conformity. Since the approval of the Transbay Program in 2004, EPA has mandated a quantitative particulate matter hotspot analysis for projects of local air quality concern. According to the EPA Transportation Conformity Guidance, the following types of projects are considered Projects of Air Quality Concern (POAQC):

- new or expanded highway projects that have a significant number of or significant increase in diesel vehicles (defined as greater than 125,000 annual average daily traffic, and 8 percent or more of such annual average daily traffic is diesel truck traffic);
- projects affecting intersections that are at a Level of Service D, E, or F, with a significant number of diesel vehicles, or that that will change to Level of Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- new bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and/or
- projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ or PM_{10} implementation plan or implementation plan submission, as appropriate, as sites of possible violation.

EPA released a public guidance document, Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (EPA-420-B-10-040, December 2010), in which EMFAC is the designated mobile emissions model and the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) and CAL3QHCR are the designated air-dispersion models for the particulate matter hotspot conformity analyses.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on air quality, and to avoid or mitigate those impacts when feasible.

California Ambient Air Quality Standards and Attainment Status

Table 3.13-2 shows a side-by-side comparison of the National and California Ambient Air Quality Standards (CAAQS) presented in the 2004 FEIS/EIR and current standards. The following changes have been made to the CAAQS:

- An 8-hour O_3 standard of 0.070 ppm was established.
- The 1-hour NO_2 standard was lowered from 0.25 to 0.18 ppm.
- An annual NO_2 standard of 0.030 ppm was established.
- The annual PM_{10} standard was lowered from 30 to 20 $\mu g/m^3$.
- An annual $PM_{2.5}$ standard of 12 $\mu g/m^3$ was established.

Regarding state attainment designations, the 2004 FEIS/EIR identified the SFBAAB as a nonattainment area for O_3 and PM_{10}. These designations remain in place. In addition, the SFBAAB is designated as a nonattainment area for $PM_{2.5}$.

Regional

The BAAQMD attains and maintains air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the federal and California CAAs.

In 2009, the BAAQMD released an update to its CEQA Guidelines (BAAQMD 2009). This is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents prepared in the San Francisco Bay Area. The handbook contains the following applicable components:

- criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- methods available to mitigate air quality impacts; and
- information for use in air quality assessments and environmental documents that will be updated more frequently, such as air quality data, regulatory setting, climate, and topography.

The BAAQMD prepares Ozone Attainment Plans for the national O_3 standard and clean air plans for the California standard in coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments. With respect to applicable air quality plans, the BAAQMD prepared the 2010 Clean Air Plan (CAP) to address nonattainment of the national 1- and 8-hour O_3 standard in the SFBAAB. The three purposes of the 2010 CAP are as follows: reduce emissions and decrease ambient concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce greenhouse gas emissions to protect the climate.

Local

San Francisco General Plan Air Quality Element

The San Francisco General Plan includes the 1997 Air Quality Element (City and County of San Francisco 2000.). The objectives specified by the City are as follows:

Objective 1: Adhere to state and federal standards and regional programs.

Objective 2: Reduce mobile sources of air pollution through implementation of the Transportation Element of the San Francisco 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 emissions reductions.

San Francisco Health Code Construction Dust Control Ordinance

The San Francisco Health Code Article 22B and San Francisco Building Code Section 106A.3.2.6 collectively constitute the City's Construction Dust Control Ordinance (adopted in July 2008). The Construction Dust Control Ordinance requires that all site preparation work, demolition, or other construction activities within the City 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 specific dust control measures, whether or not the activity requires a permit from the Department of Building Inspection. For projects larger than 0.5 acre, the Construction Dust Control Ordinance requires that the project 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.

The Construction Dust Control Ordinance requires project sponsors 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, referred to as best management practices (BMPs), may include watering all active construction areas sufficiently to prevent dust from becoming airborne. Increasing watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used as required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code. The Construction Dust Control Ordinance has a mandate for "no visible dust." Section 1247 of Article 22B of the Public Health Code requires that all City agencies that authorize construction or other improvements on City property adopt rules and regulations to ensure that the dust control requirements identified in Article 22B are followed. The BMPs employed in compliance with the City's Construction Dust Control Ordinance provide an effective strategy for controlling fugitive dust.

San Francisco Health Code Clean Construction Ordinance

Section 6.25 of Chapter 6 of the San Francisco Administrative Code (Clean Construction Ordinance) requires clean construction practices for all City projects that consist of 20 or more cumulative days of construction. The Clean Construction Ordinance requires that off-road equipment and off-road engines with 25 horsepower or greater be fueled by biodiesel fuel grade B20 or higher; and if used more than 20 hours, either meet or exceed Tier 2 emissions standards for off-road engines or operate with the most effective verified diesel emissions-control technology. The requirement does not apply to portable or stationary generators (engines).

3.13.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

Because the 2004 FEIS/EIR determined that no significant air quality impacts would occur except during construction, the purpose of this SEIS/EIR is to determine if air quality conditions have changed since the approval of the 2004 FEIS/EIR. The analysis evaluates the additional features of the proposed project to determine if air quality impacts would occur in the project area. For this SEIS/EIR, and in accordance

with Appendix G of the CEQA Guidelines, the proposed project would have a potentially significant impact related to air quality if it were to do the following:

- conflict with or obstruct implementation of the applicable air quality plan,
- violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- expose sensitive receptors to substantial pollutant concentrations, or
- create objectionable odors affecting a substantial number of people.

The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update to the CEQA Guidelines. In May 2011, the updated BAAQMD CEQA Air Quality Guidelines were amended to include a risk and hazards threshold for new receptors and modified procedures for assessing impacts related to risk and hazard impacts. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD CEQA Air Quality Guidelines. The court did not determine whether the thresholds of significance were valid on their merits, but found that the adoption of the thresholds was a project under CEQA. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD complied with CEQA.

Following the court's order, the BAAQMD released revised CEOA Air Quality Guidelines in May 2012 that include guidance on calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures, and that set aside the significance thresholds. The BAAQMD recognizes that lead agencies may rely on the previously recommended Thresholds of Significance contained in its CEQA Guidelines adopted in 1999. The Alameda County Superior Court, in ordering BAAQMD to set aside the thresholds, did not address the merits of the science or evidence supporting the thresholds. Despite the Superior Court's ruling, and in light of the subsequent case history discussed below, the science and reasoning contained in the BAAQMD 2011 CEQA Air Quality Guidelines provide the latest state-of-the-art guidance available. For that reason, substantial evidence supports continued use of the BAAQMD 2011 CEQA Air Quality Guidelines.

On August 13, 2013, the First District Court of Appeal ordered the trial court to reverse the judgment and uphold the BAAQMD's CEQA Guidelines (California Building Industry Ass'n v. Bay Area Air Quality Mgmt. Dist., Case No. A135335 & A136212; Court of Appeal, First District, August 13, 2013). On November 26, 2013, the California Supreme Court granted review on the issue of whether the toxic air contaminants thresholds are consistent with CEQA; specifically, whether CEQA requires analysis of exposing project residents or users to existing environmental hazards. Accordingly, in addition to the substantial evidence supporting their use by lead agencies, the BAAQMD's CEQA Guidelines have been found by the courts to be valid except for the single issue on review. Briefing was completed on May 27, 2014 and oral arguments were heard on October 7, 2015, but the State Supreme Court has not issued a decision yet.

Although the outcome of this case presents uncertainty for agencies and project applicants regarding proper evaluation of toxic air contaminants in CEQA documents, lead agencies still have a duty to evaluate impacts related to air quality and greenhouse gas emissions. In addition, CEQA grants lead agencies broad discretion to develop their own thresholds of significance, or to rely on thresholds previously adopted or recommended by other public agencies or experts so long as they are supported by substantial evidence. Accordingly, this SEIS/EIR uses BAAQMD's 2011 thresholds in this Section 3.13 for air quality and in Section 3.14 for climate change and greenhouse gas emissions to evaluate project impacts.

Criteria Pollutants and Ozone Precursors

In determining whether the proposed project would violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase of any criteria air pollutant, this analysis considers whether the proposed project would result in emissions of criteria pollutants and O_3 precursors in excess of the thresholds of significance shown in Table 3.13-4. Projects that result in emissions below these thresholds would not be considered to contribute to an existing or projected air quality violation or result in a cumulatively considerable net increase in emissions. These quantitative thresholds for construction emissions did not exist when the 2004 FEIS/EIR was prepared. Nevertheless, mitigation measures to reduce construction air emissions were adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program and would be implemented as part of the proposed project.

Table 3.13-4
Criteria Pollutant and Ozone Precursor Significance Thresholds

Pollutant	**Construction-Related Average Daily Emissions (pounds per day)**	**Operational-Related**	
Criteria Air Pollutants and Precursors (Regional)		**Average Daily Emissions (pounds per day)**	**Maximum Annual Emissions (tons per year)**
Reactive Organic Gas (ROG)	54	54	10
Nitrogen Oxides (NO_X)	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10
Carbon Monoxide (CO)	None	9.0 parts per million (8-hour average) 20 parts per million (1-hour average)	
Fugitive Dust	Implement all Basic Construction Control Measures	None	
Source: BAAQMD 2010a			

Health Risks

Projects that require a substantial amount of heavy-duty diesel vehicles would result in emissions of diesel particulate matter (DPM) and possibly other toxic air contaminants (TACs) that may affect nearby sensitive receptors. The BAAQMD has established the following thresholds at the maximally exposed individual sensitive receptor: excess cancer risk of 10 per 1 million, excess non-cancer risk that exceeds a 1.0 Hazard Index, and/or an annual average $PM_{2.5}$ increase of 0.3 $\mu g/m^3$ (BAAQMD 2010a).

Consistency with Applicable Air Quality Plan

The current applicable air quality plan for the SFBAAB region is the 2010 CAP. Consistency with this plan is the basis for determining whether the proposed project would conflict with or obstruct implementation of an applicable air quality plan. To determine consistency with the 2010 CAP, this

analysis considers whether the proposed project would support the primary goals of the 2010 CAP, include applicable control measures from the CAP, and disrupt or hinder implementation of control measures identified in the CAP.

Cumulative Emissions

Regional Emissions. Regional air quality impacts are, by their very nature, cumulative impacts. Emissions from past, present, and future projects contribute to adverse regional air quality impacts on a cumulative basis. In developing project-level thresholds of significance for regional emissions, BAAQMD considered the emissions levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the regional significance threshold shown in Table 3.13-4, emissions would be cumulatively considerable, resulting in significant adverse air quality impacts on the region's existing air quality conditions. No additional analysis is needed to assess cumulative impacts of emissions.

Health Risks. With respect to localized health risks, although most of San Francisco is endowed with good air quality, portions of the City that are close to freeways, busy roadways, and other sources of air pollution experience higher concentrations of air pollutants. These air pollution "hotspots" result in additional health risks for affected populations. The BAAQMD has established the following cumulative thresholds at the maximally exposed individual sensitive receptor: excess cancer risk of 100 per 1 million, excess non-cancer risk that exceeds a 10.0 Hazard Index, and/or an annual average $PM_{2.5}$ increase of 0.8 $\mu g/m^3$ (BAAQMD 2010a).

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the air quality effects will be the same as those presented in Section 5.7 Air Quality (pages 5-53 to 5-64) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects plus Mitigation Measures AC 1 through AC 15 that previously were adopted and incorporated into the project are provided below. The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR. Both operational and construction analyses accounted state and federal mandates for lowering vehicle emissions.

Operational Air Quality Impacts. The Transbay Program is projected to reduce the number of miles traveled by autos in the region, resulting in an overall reduction of air emissions. The DTX is expected to produce a decrease in vehicle miles of travel, resulting in a reduction of emissions associated with automobiles. The 2004 FEIS/EIR evaluated operational air quality impacts at a microscale, focusing on CO concentrations at the same 27 intersections that were evaluated in the project's traffic report. The air quality modeling showed that with the DTX and maximum development under the Redevelopment Plan, the Transbay Program will not cause CO concentrations to exceed state or federal standards at the study intersections. The transit-oriented redevelopment near the transit hub is expected to divert private automobile trips to public transit. Additional air quality analysis conducted for the bus storage area confirmed that pollutant concentrations will remain below the applicable CAAQS and would not adversely affect residents adjacent to the facility. The 2004 FEIS/EIR concluded that operation of the Transbay Program will have no adverse effect/less-than-significant impact on air quality.

Construction-Related Air Quality Impacts. Construction of the No Action Alternative will cause pollutant emissions from diesel-powered construction equipment, CO emissions from worker vehicles, and fugitive dust or PM10 emissions from ground-disturbing activities. To mitigate construction-related

air quality impacts, the following mitigation measures were adopted in the 2004 FEIS/EIR and currently are being implemented as part of Phase 1 construction and will be implemented for Phase 2:

- **AC 1 –** ensure that, as part of the contract provisions, the project contractor is required to implement the measures below.
- **AC 2** – water all active construction areas at least twice daily.
- **AC 3** – cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- **AC 4** – pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- **AC 5** – sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- **AC 6** – sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- **AC 7** – install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- **AC 8** – replant vegetation in disturbed areas as quickly as possible.
- **AC 9** – minimize use of on-site diesel construction equipment, particularly unnecessary idling.
- **AC 10** – shut off construction equipment to reduce idling when not in direct use.
- **AC 11** – where feasible, replace diesel equipment with electrically powered machinery.
- **AC 12** – locate diesel engines, motors, or equipment as far away as possible from existing residential areas.
- **AC 13** – properly tune and maintain all diesel power equipment.
- **AC 14** – suspend grading operations during first- and second-stage smog alerts, and during winds greater than 25 miles per hour.
- **AC 15** – after the construction phase, power wash and/or paint buildings with visible signs of dirt and debris from the construction site (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).

The 2004 FEIS/EIR concluded that construction of the Transbay Program will have no adverse effect/less-than-significant impact on air quality during construction, with implementation of the above mitigation measures.

Proposed Project

The proposed project components consist of Phase 2 refinements and other transportation improvements and land development at or adjacent to elements of the previously approved Transbay Program, which was analyzed in the 2004 FEIS/EIR; therefore, the previous air quality analysis covers the area and

impacts directly relevant to the proposed project. The assessment below focuses on the proposed project components. Mitigation Measures AC 1 through AC 15 (identified in the 2004 FEIS/EIR for the Transbay Program and adopted and incorporated into the project) would continue to apply and would be implemented as part of the proposed project. The full text of these measures is reproduced in Appendix C of this SEIS/EIR.

Impact AQ-1: The proposed project would not conflict with or obstruct implementation of applicable air quality plans. (No Adverse Effect/Less-than-Significant Impact)

Transportation Conformity. Transportation conformity is required under CAA Section 176(c) (42 USC 7506[c]) to ensure that federally supported highway and transit project activities are consistent with the purpose of the State Implementation Plan (SIP). Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. EPA's Transportation Conformity Guidance (40 CFR 51.390 and Part 93) establishes the criteria and procedures for determining whether transportation activities conform to the SIP. Under the criteria, transportation projects must demonstrate conformity on regional and local levels.

Regional Conformity. The current Regional Transportation Plan is the 2035 Plan for the San Francisco Bay Area (referred to as Plan Bay Area). Phase 2 of the Transbay Program is listed in this financially constrained plan, which was adopted by the MTC on April 22, 2009. The Federal Highway Administration and FTA made a regional conformity determination for this plan in May 2009. Phase 2 is also included in the financially constrained 2013 Transportation Improvement Program. The Federal Highway Administration and FTA approved the 2013 Transportation Improvement Program on August 12, 2013. The design, concept, and scope of Phase 2 are consistent with the descriptions in the Regional Transportation Plan and Transportation Improvement Program, and the "open to traffic" assumptions of the MTC regional emissions analysis.

Project Conformity. Project conformity requires a demonstration that the proposed project would not result in new local carbon monoxide (CO) or $PM_{2.5}$/PM_{10} exceedances, or worsen existing violations.

Carbon Monoxide Hotspot Analysis. To demonstrate conformity, a project must not cause or contribute to new localized CO violations or increase the frequency or severity of existing CO violations. According to the BAAQMD, air quality monitors have not recorded an air exceedance of the federal CO standards since at least 1994. CO concentrations throughout the state have steadily declined over time as vehicle engines have become more efficient and less polluting. The BAAQMD has recognized this trend, and completed technical screening analyses that indicate that there is no potential for a CO hotspot when the following occurs:

- project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; or

- project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The proposed project components would not increase traffic volumes at any intersection in the traffic study area to more than 24,000 vehicles per hour. In traffic analyses, a single lane under free-flow conditions can accommodate approximately 2,000 vehicles per hour. None of the study area intersections evaluated in Section 3.2, Transportation, have enough lanes to serve 24,000 vehicles per hour.

Based on the data from the traffic analysis, study intersections are expected to carry fewer than 5,000 vehicles during the weekday PM peak hour under Cumulative Conditions. Therefore, no potential exists for a new localized CO violation, and further analysis of CO concentrations generated by traffic is not required.

The proposed project component involving additional trackwork south of the Caltrain yard would affect vehicle traffic circulation at the at-grade crossing of the 16th Street Caltrain tracks. Cars delayed at the crossing by passing trains would generate air emissions that could contribute to localized CO hotspots. Use of the turnback and maintenance of way track would require the crossing gate at 16th Street to be lowered twice (for 70 seconds each time) for each train movement during the weekday AM and PM peak hours. Vehicles heading east or west on 16th Street would be required to wait at the crossing gate during the train movements. Because this proposed project component would not increase traffic volumes, the additional wait time because of the train movements would be the only factor affecting the potential for a CO hotspot. However, the additional wait time, averaged over an entire day, is a relatively short period, and therefore is not anticipated to substantially increase the potential for a CO hotspot. In addition, as explained in Section 3.2, Transportation, with mitigation adopted as part of the PCEP, the intersection would operate at acceptable levels of service in accordance with City standards. Adverse changes to this level of service as a result of the proposed project would be mitigated by New-MM-TR-1.1, as explained in Section 3.2 Transportation. Therefore, considering the relatively small increase in idling time spread throughout the operational day, decreasing ambient CO concentrations, and vehicle emission rates, and the mitigation measures adopted for the PCEP and recommended for the proposed project to improve the intersection's service level, additional vehicle idling emissions caused by the additional trackwork south of the Caltrain yard would have a no adverse effect/less-than-significant impact with respect to a CO hotspot.

$PM_{2.5}$/PM_{10} Hotspot Analyses. Qualitative particulate matter hotspot analysis is required under EPA's Transportation Conformity Guidance for POAQC. Phase 2 of the Transbay Program was presented to the Interagency Consultation Task Force on January 24, 2013. The Task Force determined on February 21, 2013, that Phase 2 is not a POAQC. This conclusion is reported in the MTC Fund Management System database, which also states that the project conformity analysis is complete (MTC 2015). The proposed project components would not alter the definition of Phase 2 to make it a POAQC; therefore, a particulate matter hotspot analysis is not required.

Consistency with Air Quality Plans to Attain CAAQS. The 2004 FEIS/EIR demonstrated that Phase 1 would improve regional air quality. Implementation of Phase 2 and the proposed project would further reduce regional emissions by extending Caltrain and high-speed rail service into the new Transit Center. This extension would improve regional connectivity and encourage transit ridership. The proposed project includes an intercity bus facility, bicycle facilities, and a pedestrian connector, all of which would contribute to reductions in passenger vehicle trips and facilitate non-vehicular trips. In addition, adjacent land development at two of the proposed vent structure sites would be consistent with City policies to locate infill residential and office development near transit lines. All of these components would contribute to improvements in regional transit and the reduction of passenger vehicle miles traveled. Therefore, the proposed project would result in a no adverse effect/less-than-significant impact related to applicable air quality plans.

Impact AQ-2: The proposed project would not result in substantial regional air emissions. (Beneficial Effect/Beneficial Impact)

The 2004 FEIS/EIR estimated regional emissions based on the number of vehicle miles diverted from private automobiles and public buses to the electric-powered trains operating on the Downtown Rail Extension (DTX). The proposed project would improve access to regional transit and encourage increased

ridership through transit-oriented development. Specifically, the proposed intercity bus facility and the bicycle ramp would encourage alternate modes of travel that would further reduce vehicle miles traveled. In addition, the adjacent land development would promote transit-oriented development that would be within walking distance of transit services. Most notably, the proposed widened throat structure and the extended train box would enable HSR service to access the Transit Center and would allow the regional air quality benefits projected for the HSR to be realized. These benefits would not occur under the No Action Alternative, however, because the DTX would not meet the HSR design specifications and implementing the HSR service to the Transit Center would not be feasible.

A detailed ridership analysis completed for the DTX determined that the 29,700 passengers arriving and departing at the Transit Center would reduce VMT in San Francisco by 122,800 miles (TJPA 2008). In addition to the DTX study, various ridership studies have been completed for DTX and HSR. For example, the California High-Speed Train Merced to Fresno Section EIS/EIR estimated that HSR would reduce passenger car VMT in San Francisco by 143,436 miles per day in 2035 (California High Speed Rail Authority 2011). The Peninsula Corridor Electrification Project estimated that implementation of that project would increase 2020 daily ridership from 57,000 to 69,000 and 2040 daily ridership from 84,000 to 111,000. The 2012 HSR Business Plan listed 2025 annual ridership ranging from 5.8 to 10.5 million. The 2014 HSR Business Plan 50 percent confidence level for 2029 Phase 1 annual ridership is 28.4 million and 2040 ridership is 33.1 million. Regardless of the specific ridership study and year of analysis, each study consistently shows that these rail transit systems result in increased ridership, which results in regional air quality emission reductions.

The proposed project would result in a reduction of long-term mobile source emissions and not result in regional emissions that exceed the significance thresholds established by the BAAQMD to assess the potential for regional air quality violations. The proposed project would further contribute to the beneficial effects identified for the No Action Alternative in terms of reducing regional air emissions.

Impact AQ-3: The proposed project would not expose sensitive receptors to substantial pollutant concentrations after implementation of proposed mitigation to reduce operational emissions of diesel particulate matter and other toxic air contaminants near residential uses. (No Adverse Effect/Less-than-Significant Impact with Mitigation)

Exposure to Pollutant Concentrations in Excess of NAAQS. Exposure to localized pollutant concentrations have been assessed through the project-level Transportation Conformity Guidance. As discussed above under Impact AQ-1, the proposed project would not generate pollutant concentrations that exceed the NAAQS based on project-level Transportation Conformity Guidance and project-related traffic information discussed in Section 3.2, Transportation. Therefore, the proposed project would result in a no adverse effect/less-than-significant impact related to pollutant concentrations in excess of NAAQS.

Carbon Monoxide Hotspot Analysis. In accordance with the BAAQMD guidelines used for this analysis (BAAQMD 2010b), no potential exists for a CO hotspot to occur when either of the following conditions are met:

- project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; or

- project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

As discussed above under Impact AQ-1, the proposed project components would not increase traffic volumes at any intersection in the traffic study area to more than 24,000 vehicles per hour. As a result, there is no potential for a new localized CO violation, and further analysis of CO concentrations is not required.

Emergency Diesel Generators. Vent structures of the proposed project would have emergency generators. In addition, an emergency generator would be installed at one end of the Temporary Terminal to operate critical terminal functions. Emergency generators are regulated by the BAAQMD through its New Source Review (Regulation 2 Rule 5) permitting process. Although emergency generators are intended to be used only during periods of power outages, monthly testing of the generators would be required. The BAAQMD limits testing to no more than 50 hours per year. Additionally, as part of the permitting process, the BAAQMD limits the excess cancer risk from any facility to no more than 10 excess cancer cases per 1 million population, and requires any source that would result in an excess cancer risk greater than 10 per 1 million population to install Best Available Control Technology for Toxics. Because the permitting process has not been initiated and the site-specific risk has not been estimated, this analysis assumes that the emergency back-up generators have the potential to expose sensitive receptors to concentrations of diesel emissions.

Health Risk Assessment. The proposed project could expose new and existing sensitive land uses to increased pollutant concentrations.

New Sensitive Receptors. The proposed project would potentially include the development of residential units above the intercity bus facility, and residential units could be combined with ventilation structures at two other locations at Second and Harrison Streets and at Third and Townsend Streets. These future development sites would be located in an urban environment that contain high roadway volumes with existing sources of $PM_{2.5}$, DPM, and carcinogenic compounds from Interstate 80, Interstate 280, and waterfront activities.

The City, in partnership with the BAAQMD, has modeled and assessed air pollutant impacts from mobile, stationary, and area sources within the City. This assessment has resulted in the identification of air pollutant hotspots, or areas that deserve special attention when locating uses that either emit TACs or have uses that are considered sensitive to air pollution. The City has established design features to reduce exposure to air pollutants, such as air filtration systems. Without implementation of these features, new sensitive receptors could be exposed to significant pollutant concentrations.

Existing Sensitive Receptors. The proposed intercity bus facility could expose existing sensitive land uses to increased TAC concentrations from bus activity. The Millennium Tower is the nearest residential land use to the proposed intercity bus facility, and represents the land use with the greatest potential to be affected during operations. A health-risk assessment, which conservatively assumes that all exposure is experienced outdoors, was completed to determine if bus activity would generate a significant acute, chronic, carcinogenic, or annual $PM_{2.5}$ exposure risk for residents at the Millennium Tower. Urban bus emissions rates were obtained from the California Air Resources Board (CARB) EMFAC2011 emissions model. The emissions estimate accounted for 10 minutes of idling exhaust (average of 5 minutes on arrival and 5 minutes on departure) and starting exhaust emissions. The air dispersion modeling used the AERMOD version 13350 atmospheric dispersion modeling system, which accounts for local meteorological conditions. As shown in Table 3.13-5, the intercity bus facility would not generate emissions that exceed BAAQMD significance thresholds at the Millennium Tower, which is the closest sensitive receptor. The bus facility would not affect residents at The Millennium Tower, or children at the PG&E Childcare Facility, which is further away than the Millennium Tower.

Table 3.13-5
Estimated Health Risk Associated with the Intercity Bus Facility

Health Risk Category	BAAQMD Threshold	Concentration/Risk
Annual average $PM_{2.5}$ exposure	0.30 µg/m^3	0.002 µg/m^3
Cancer risk	10 in 1 million	2.6 in 1 million
Non-cancer hazard index, chronic exposure	1.0	0.0005
Non-cancer hazard index, acute exposure	1.0	0.27
Sources: BAAQMD 2010b; data provided by Terry A. Hayes Associates in 2014		

Mitigation Measures. Implementing the following new mitigation measures would reduce the potentially adverse/significant air quality impacts relating to exposure of receptors to substantial emissions from emergency generators, the intercity bus facility, and ventilation structures to not adverse/less than significant.

New-MM-AQ-3.1 *Equip Diesel Generators with Applicable Tiered Emissions Standards.* All diesel generators shall have engines that meet Tier 4 Final or Tier 4 Interim emissions standards, or meet Tier 2 emissions standards and are equipped with a CARB Level 3 Verified Diesel Emissions Control Strategy.

New-MM-AQ-3.2 *Require and Implement Ventilation Plans for Proposed Residential Land Development.* For residential development on the intercity bus facility or ventilation structure sites, the project sponsor shall comply with the following measures:

a. *Air Filtration and Ventilation Requirements.* Prior to receipt of any residential building permit, the project sponsor shall submit a ventilation plan for the proposed building(s). The ventilation plan shall show that the building ventilation system removes at least 80 percent of the outdoor $PM_{2.5}$ concentrations from habitable areas and shall be designed by an engineer certified by the ASHRAE. The engineer shall provide a written report documenting that the system meets the 80 percent performance standard identified in this measure and offers the best available technology to minimize outdoor to indoor transmission of air pollution.

b. *Maintenance Plan.* Prior to receipt of any building permit, the project sponsor shall present a plan that ensures ongoing maintenance for the ventilation and filtration systems.

c. *Disclosure to Buyers and Renters*. The project sponsor shall ensure disclosure to buyers and/or renters that the building is located in an area with existing sources of air pollution, and that the building includes an air filtration and ventilation system designed to remove 80 percent of outdoor particulate matter. Occupants shall be informed of the proper use of the installed air filtration system.

Impact AQ-4: The proposed project would not expose people to objectionable odors. (No Adverse Effect/Less-than-Significant Impact)

Land uses and industrial operations that are associated with odor complaints include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants. The proposed project would not include any land use or activity that typically generates adverse odors. Therefore, the proposed project would not result in a potentially adverse effect/significant impact related to odors.

Impact C-AQ-5: Construction activity would generate regional emissions of criteria pollutants and ozone precursors which would be less than the applicable standards for each pollutant. (No Adverse Effect/Less-than-Significant with Mitigation)

Construction activities typically result in emissions of fugitive dust, criteria air pollutants, and DPM. Emissions of criteria pollutants and DPM are primarily a result of the combustion of fuel from on-road and off-road vehicles and equipment. However, reactive organic gas (ROG) is also emitted from activities that involve painting or other types of architectural coatings and asphalt paving activities.

Fugitive Dust. Project-related demolition, excavation, grading, and other construction activities may cause wind-blown dust that could contribute to the release of particulate matter into the local atmosphere. 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 particulate matter in general, and also due to specific contaminants such as lead or asbestos that may be constituents of the dust.

The 2004 FEIS/EIR included mitigation measures designed to control fugitive dust that were derived from basic control measures and enhanced control measures recommended by the BAAQMD. These mitigation measures were superseded by a series of amendments to the San Francisco Building and Health Code known as the Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008). The Construction Dust Control Ordinance was created with the intent of reducing the quantity of dust generated during site preparation, demolition, and construction work to protect the health of the general public and of on-site workers, to minimize public nuisance complaints, and to avoid orders to stop work by the Department of Building Inspection. Current construction activities associated with Phase 1, and future construction activities associated with Phase 2 of the Transbay Program are required by law to comply with the Construction Dust Control Ordinance.

In compliance with the Construction Dust Control Ordinance, the proposed project would be required to implement a variety of control measures, including watering, wet sweeping, or vacuuming, and covering stockpiles. The proposed project would also be required to prepare a Dust Control Plan to demonstrate compliance with the Construction Dust Control Ordinance. Compliance with these regulations and procedures set forth by the San Francisco Building Code would help reduce potential dust, resulting in a no adverse effect/less-than-significant related to construction dust impacts.

Criteria Pollutants. Construction activities would generate air emissions from various sources, including heavy-duty equipment engines, truck engines, and worker commute vehicles. Refer to Section 2.2.2, Proposed Project, and Table 2-5 of this SEIS/EIR for a detailed description of construction activities and equipment. A detailed analysis of the proposed project, involving the Phase 2 refinements and the other transportation improvements, was prepared using construction equipment and scheduling assumptions from the TJPA. Construction emissions were estimated using the OFFROAD model for heavy-duty equipment emissions rates and EMFAC2011 for truck exhaust emissions rates. Average daily construction emissions are shown in Table 3.13-6. Unmitigated emissions could exceed the significance thresholds established by the BAAQMD for NO_X, but would be below thresholds for ROG and particulate

matter. The majority of NO_X emissions would be attributed to activities of heavy-duty construction equipment such as cranes and excavators. The high level of NO_X emissions would be due to construction activities that could occur concurrently at the various proposed project component sites. (As explained earlier for the No Action Alternative, such quantification of construction emissions was not required for the 2004 FEIS/EIR. because the BAAQMD did not require detailed analysis of construction emissions at that time. The quantified analysis below is only for the proposed project and complies with BAAQMD's more current guidance for construction emissions.)

Table 3.13-6
Proposed Project Construction Emissions*

	Average Daily Emissions (Pounds per Day)			
	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Estimated Construction Air Emissions from the Proposed Project	4	133	3	3
Regional Significance Threshold	54	54	82	54
Exceed Threshold?	**NO**	**YES**	**NO**	**NO**

Notes: ROG = reactive organic gas; NO_X = nitrogen oxides; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
*The construction emissions in this table are for the Phase 2 refinements and other transportation improvements that comprise the proposed project. In other words, the emissions reported in this table are estimates of the incremental air emissions associated only with the proposed project. The estimated emissions are based on the construction activity, types of equipment, and construction schedule described in Section 2.2.2, Proposed Project, and particularly Table 2-4 and Table 2-5. No construction emissions estimates have been prepared for the approved Transbay Program.
Source: Data provided by Terry A. Hayes Associates in 2014

Mitigation Measure. In addition to the mitigation measures that were previously adopted and incorporated into the Transbay Program (i.e., Mitigation Measures AC 1 through AC 15 from the 2004 FEIS/EIR), New-MM-C-AQ-5.1, set forth below, would require preparation and implementation of an emissions control plan. Various mitigation strategies were considered to reduce emissions levels. As stated above, the high level of NO_X emissions would be due to individual construction activities that could occur concurrently at the various proposed project component sites. The construction schedule reflects a conservative assumption to result in the greatest air quality impacts. It may be possible to extend the construction schedule, but a longer construction phase would lengthen the period for other construction impacts, such as traffic disruption, noise, and air emissions; increase the cost of the proposed project; and delay the start of rail service to the Transit Center. Consequently, this strategy to reduce NO_X emissions was not considered feasible.

Both EPA and the State of California set emissions standards for new off-road equipment engines, ranging from Tier 1 to Tier 4. To meet the Tier 4 emissions standards, engine manufacturers are required to produce new engines with advanced emissions-control technologies similar to those already expected for highway trucks and buses. Exhaust emissions from these engines will decrease by more than 90 percent. The use of engines that meet or exceed either EPA or CARB Tier 2 off-road emissions standards, and engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), in combination with Tier 4 diesel construction equipment to meet the BAAQMD construction emissions standards would reduce exposure construction emissions to a not adverse/less than significant level. In addition, construction emissions could be lowered if newer, less-powerful, or smaller diesel equipment is used than assumed in this analysis. With implementation of New-MM-C-AQ-5.1 in addition to the use of Tier 4 equipment that will be phased in starting in 2016, this impact would be reduced to a not adverse/less-than-significant level.

New-MM-C-AQ-5.1 Prepare and Implement an Emissions Plan. The TJPA shall comply with the following measures to reduce construction emissions:

a. Construction Emissions Minimization Plan. Prior to issuance of a construction permit, the TJPA shall prepare a Construction Emissions Minimization Plan (Emissions Plan) detailing project compliance with the following requirements:

1. All off-road equipment greater than 25 horsepower and operating for more than 20 total hours over the entire duration of construction activities shall meet the following requirements:

   a. Where alternative sources of power are available, portable diesel engines shall be prohibited.

   b. All off-road equipment shall have the following:

      i. engines that meet or exceed either EPA or CARB Tier 2 off-road emissions standards, and

      ii. engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS).

   c. Exceptions:

      i. Exceptions to a(1)(a) may be granted if the TJPA has evidence that an alternative source of power is limited or infeasible at the project site, and that the requirements of this exception provision apply. Under this circumstance, the TJPA shall prepare the documentation indicating compliance with a(1)(b) for on-site power generation.

      ii. Exceptions to a(1)(b)(ii) may be granted if the TJPA has evidence that a particular piece of off-road equipment with an CARB Level 3 VDECS is (1) technically not feasible, (2) would not produce desired emissions reductions due to expected operating modes, (3) installing the control device would create a safety hazard or impaired visibility for the operator, or (4) there is a compelling emergency need to use off-road equipment that are not retrofitted with a CARB Level 3 VDECS.

      iii. If an exception is made pursuant to (a)(1)(c)(ii), the TJPA shall provide the next cleanest piece of off-road equipment, as provided by the step-down schedule shown in Table 3.13-7.

Table 3.13-7
Off-Road Equipment Compliance Step-Down Schedule

Compliance Alternative	Engine Emissions Standard	Emissions Control
1	Tier 2	CARB Level 2 VDECS
2	Tier 2	CARB Level 1 VDECS
3	Tier 2	Alternative Fuel (Not a VDEC)

Notes:
CARB = California Air Resources Board; VDECS = Verified Diesel Emissions Control Strategy
Source: data compiled by AECOM in 2014

If the requirements of (a)(1)(b) cannot be met, then the TJPA shall meet Compliance Alternative 1. If the TJPA is not able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 shall be met. If the TJPA is not able to supply off-road equipment meeting Compliance Alternative 2, then Compliance Alternative 3 shall be met.

2. The TJPA shall require idling times for off-road and on-road equipment to be limited to no more than 2 minutes, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish, Chinese) in designated queuing areas and at the construction site to remind operators of the 2-minute idling limit.

3. The TJPA shall require that construction operators properly maintain and tune equipment in accordance with manufacturer specifications.

4. The Emissions 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. Off-road equipment descriptions and information shall include equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, expected fuel usage, and hours of operation. For VDECS-installed equipment, reporting shall indicate technology type, serial number, make, model, manufacturer, CARB verification number level, installation date, and hour meter reading on installation date. For off-road equipment using alternative fuels, reporting shall indicate the type of alternative fuel being used.

5. The Emissions Plan shall be kept on-site and be available for review by any persons requesting it. A legible sign shall be posted at the perimeter of the construction site indicating to the public the basic requirements of the Emissions Plan and a way to request a copy of the plan. The TJPA shall provide copies of the Emissions Plan to members of the public as requested.

b. *Reporting*. Monthly reports shall be prepared to indicate the construction phase and off-road equipment information used during each phase, including the information required in a(4). In addition, for off-road equipment using alternative fuels, reporting shall include the actual amount of alternative fuel used.

Within 6 months of completion of construction activities, the TJPA shall prepare a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase. For each phase, the report shall include detailed information required in a(4). In addition, for off-road equipment using alternative fuels, reporting shall include the actual amount of alternative fuel used.

c. *Certification Statement and On-Site Requirements*. Prior to the commencement of construction activities, the TJPA shall certify (1) compliance with the Emissions Plan and (2) all that applicable requirements of the Emissions Plan have been incorporated into contract specifications.

Impact C-AQ-6: Construction activities would not generate toxic air contaminants, including diesel particulate matter, which would expose sensitive receptors to increased pollutant concentrations. (No Adverse Effect/Less-than-Significant with Mitigation)

Construction activity would generate exhaust emissions that could increase TAC concentrations at sensitive land uses. Typically, construction projects generate DPM in a single area for a short period of time. The dose of TACs to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period to a fixed amount of emissions results in a higher exposure level and higher health risks for the maximally exposed individual.

To reduce community exposure, a number of federal and state regulations have been implemented requiring cleaner off-road equipment. Specifically, both EPA and the State of California have set emissions standards for new off-road equipment engines, ranging from Tier 1 to Tier 4. Tier 1 emissions standards were phased in between 1996 and 2000. Tier 4 Interim and Final emissions standards for new engines were phased-in starting from 2008 and will continue through 2015 and beyond. To meet the Tier 4 emissions standards, engine manufacturers will be required to produce new engines with advanced emissions-control technologies. EPA estimates that by implementing the federal Tier 4 standards, NO_X and particulate matter emissions will be reduced by more than 90 percent (EPA 2004). In addition, California regulations limit maximum idling times to 5 minutes, which further reduces public exposure to DPM emissions.[1]

Construction activities do not lend themselves to analysis of long-term health risks because of their temporary and variable nature. As explained in BAAQMD's CEQA Air Quality Guidelines (BAAQMD 2011):

[1] California Code of Regulations, Title 13, Division 3, Section 2485.

> Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to emission concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB 2005). In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. Therefore, it is difficult to produce accurate estimates of health risk.

Therefore, project-level analyses of construction activities have a tendency to produce overestimated assessments of long-term health risks. However, within air pollution hotspots, construction activities may adversely affect populations that are already at a higher risk for adverse long-term health risks, such as residences, from existing sources of air pollution. The majority of construction activities would be located in areas that have been identified by the City as air pollution hotspots. The City has established a standard mitigation measure to reduce exposure to the greatest extent feasible. Without implementation of the mitigation measure, sensitive receptors would potentially be exposed to significant pollutant concentrations over the 45-month construction period.

Mitigation Measure. The same mitigation measure identified for Impact C-AQ-5, above, would apply to Impact C-AQ-6. Implementation of New-MM-C-AQ-5.1 would result in the maximum feasible reduction of DPM emissions. Furthermore, the use of Tier 4 diesel construction equipment that will be phased in starting in 2016 or Tier 2/Tier 3 equipment with Level 3 VDECS would reduce exposure to a level that would not exceed any of the significance thresholds identified by the BAAQMD. Also, construction emissions could be lower if newer equipment is employed or less-powerful or smaller diesel equipment is used than assumed in this analysis. With implementation of the mitigation, it is not anticipated that there would be a significant long-term health impact or short-term acute or chronic health risk. This impact would be not adverse/less than significant with mitigation.

Cumulative Analysis

Impact CU-AQ-7: Operation of the proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative air quality impacts. (No Adverse Effect/Less-than-Significant Impact)

Regional air pollution is, by its nature, largely a cumulative impact. The geographic context for cumulative operational air quality effects would be the San Francisco Bay Area Air Basin. Emissions from past, present, and future projects contribute to the region's adverse air quality on a cumulative basis. No single project by itself would be sufficient in size to result in nonattainment of regional ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative adverse air quality impacts. The project-level thresholds established by the BAAQMD for criteria pollutants and ozone precursors are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a cumulatively considerable net increase in criteria air pollutants.

The operational emissions from the proposed project would not exceed the project-level thresholds for criteria pollutants or ozone precursors. Not only would the proposed project not exceed project-level thresholds, but in combination with the approved DTX, the proposed project would reduce cumulative air quality levels by removing passenger vehicles from regional roadways and encouraging transit, bicycle riding, and walking. A detailed ridership analysis completed for the DTX determined that the 29,700 passengers arriving and departing at the Transit Center would reduce vehicle miles traveled in San Francisco by 122,800 miles (TJPA 2008). The regional VMT reduction, including San Mateo and Santa Clara Counties, would be 259,700 miles. In addition to the DTX study, various ridership studies have

been completed for DTX and HSR. For example, the California High-Speed Train Merced to Fresno Section DEIS/EIR estimated that high-speed rail would reduce passenger car VMT in San Francisco by 143,436 miles per day in 2035 (California High Speed Rail Authority 2011). The Peninsula Corridor Electrification Project estimated that implementation of that project would increase 2020 annual ridership from 57,000 to 69,000 and 2040 annual ridership from 84,000 to 111,000. The 2014 HSR Business Plan 50 percent confidence level for 2029 Phase 1 annual ridership is 28.4 million and 2040 ridership is 33.1 million. Regardless of the specific ridership study and year of analysis, each study consistently shows that implementation of these rail transit projects and improvements results in increased ridership, which results in regional air quality emission reductions.

Impact CU-AQ-8: Construction of the proposed project, in combination with past, present, and reasonably foreseeable development, would not result in significant cumulative air quality impacts. (No Adverse Effect/Less-than-Significant with Mitigation)

The San Francisco Bay Area Air Basin defines the geographic context for the cumulative construction-related air quality analysis. Construction air emissions are caused by soil disturbance, demolition, construction equipment emissions, and truck emissions, all of which are localized (i.e., typically within 1,000 feet per BAAQMD guidance). As a result, air emissions from other construction projects near the proposed project could cumulate with those from the proposed project to affect receptors in the proposed project area.

On a local level, receptors in the Transit Center District Plan, Transbay Redevelopment Plan, Central SoMa, and Mission Bay North areas already experience ongoing construction activities that contribute to air quality impacts in the vicinity of the proposed project. Cumulatively, construction of these projects emits ROG, NO_x, particulate matter, and TACs (notably diesel particulate matter). It is reasonable to expect that construction emissions from related development would overlap and generate cumulate emissions combined with those from the proposed project and the DTX.

Compliance with City regulations, particularly the San Francisco Construction Dust Control Ordinance (Ordinance 176-08) and San Francisco Health Code Clean Construction Ordinance, would mitigate these emissions and allow the region to attain air quality standards. In addition, New-MM-C-AQ-5.1 would apply to the proposed project as well as other construction projects in the City that exceed the BAAQMD construction thresholds of significance. Therefore, the cumulative construction air emissions are considered to be not adverse/less than significant with mitigation.

3.13.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Air Quality (Not Adverse with Mitigation)	The 2004 FEIS/EIR concluded that the project would not exceed state or federal ambient air quality standards, would conform to EPA's Transportation Conformity Guidance, and would be expected to divert private automobile trips to public transit thereby reducing regional air emissions. The proposed project analyzed in this SEIS/EIR would enable the previously approved Transbay Program to achieve the air quality benefits identified in the 2004 FEIS/EIR, and no mitigation measures would be required for regional air emissions, and CO or particulate hotspots. However, the proposed project would result in a new adverse effects not identified in the 2004 FEIS/EIR from emissions of the emergency generators proposed at the vent structure locations. With implementation of New-MM-AQ-3.1 and New-MM-AQ-3.2, these effects would be reduced and would not be adverse. The 2004 FEIS/EIR concluded that with implementation of Mitigation Measures AC 1 through 15, no adverse effect related to construction emissions would occur from the project. The proposed project analyzed in this SEIS/EIR would result in an adverse effect not identified in the 2004 FEIS/EIR related to construction emissions, based on methodologies and thresholds adopted by the BAAQMD after completion of the 2004 FEIS/EIR. However, with the implementation of the 2004 FEIS/EIR Mitigation Measures AC 1 through AC 15 previously adopted and incorporated into the Transbay Program and New-MM-C-AQ-5.1, this adverse effect would be reduced, and the proposed project effects on air quality during construction would not be adverse.
CEQA Summary	
Impact AQ-1: Conflict with or Obstruct Implementation of Applicable Air Quality Plans (Less than Significant)	The 2004 FEIS/EIR concluded that the project conformed to EPA's Transportation Conformity Guidance. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact in terms of complying with local air quality plans. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact AQ-2: Regional Air Emissions (Beneficial)	The 2004 FEIS/EIR concluded that the project would not exceed state or federal ambient air quality standards and would be expected to divert private automobile trips to public transit thereby reducing air emissions. The proposed project analyzed in this SEIS/EIR would enable the air quality benefits identified in the 2004 FEIS/EIR to be realized. Therefore, the proposed project would not result in any new impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact AQ-3: Operational Emissions (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that the project conformed to EPA's Transportation Conformity Guidance and would not exceed state ambient air quality standards, including CO concentrations, and thus no impact would occur from the project. The proposed project analyzed in this SEIS/EIR would result in new significant impacts not identified in the 2004 FEIS/EIR related to emissions from emergency generators and vent structures with a potential to expose sensitive receptors to air pollutants. Implementation of New-MM-AQ-3.1 and New-MM-AQ-3.2 would reduce potential exposure to a less-than-significant level.
Impact AQ-4: Odor (Less than Significant)	The 2004 FEIS/EIR did not specifically address odors. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact related to odors. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.

Impact C-AQ-5: Construction – Criteria Pollutants and Ozone Precursors (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that with implementation of Mitigation Measures AC 1 through 15, a less-than-significant impact related to construction emissions would occur from the project. The proposed project analyzed in this SEIS/EIR would also result in a significant construction impact, based on methodologies and thresholds adopted by the BAAQMD after completion of the 2004 FEIS/EIR. With implementation of the 2004 FEIS/EIR Mitigation Measures AC 1 through AC 15 previously adopted and incorporated into the Transbay Program, and New-MM-C-AQ-5.1, the impact of the proposed project would be less than significant and would not change the significance conclusions in the 2004 FEIS/EIR.
Impact C-AQ-6: Construction – Toxic Air Contaminants (Less than Significant with Mitigation)	The 2004 FEIS/EIR concluded that with implementation of Mitigation Measures AC 1 through 15, construction TAC emissions from the Transbay Program would be a less-than-significant impact. The proposed project analyzed in this SEIS/EIR would also result in a significant construction impact. With implementation of the 2004 FEIS/EIR Mitigation Measures AC 1 through AC 15 previously adopted and incorporated into the Transbay Program and New-MM-C-AQ-5.1, the impact of the proposed project would be less than significant and would not change the significance conclusion in the 2004 FEIS/EIR.
Impact CU-AQ-7: Cumulative – Operational Air Quality (Less than Significant)	The proposed project in combination with other reasonably foreseeable development would result in less-than-significant cumulative operational air quality effects. The proposed project would not result in any new impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures would be required for the proposed project.
Impact CU-AQ-8: Cumulative – Construction Air Quality (Less than Significant with Mitigation)	The proposed project in combination with other reasonably foreseeable development would result in significant cumulative construction air emissions of NOx and TACs. New-MM-AQ-3.1, New-MM-AQ-3.2, and New-MM-C-AQ-5.1 would reduce the cumulative impact to a less-than-significant level.

3.14 GREENHOUSE GASES AND CLIMATE CHANGE

3.14.1 Introduction

The purpose of this section is to describe how the proposed project would affect regional greenhouse gas (GHG) emissions. GHG emissions refer to airborne pollutants that are generally believed to affect global climate conditions. These pollutants have the effect of trapping heat in the atmosphere, thereby altering weather patterns and climatic conditions (EPA 2014). The 2004 FEIS/EIR did not analyze GHG emissions or potential climate change impacts; however, GHG emissions were analyzed when FRA conducted its reevaluation of the 2004 FEIS/EIR for high-speed rail (HSR) service (FRA 2010). The analysis presented in this SEIS/EIR is a new analysis to assess project GHG emissions and consistency with applicable local and regional GHG reduction plans. Potential flood risks caused by climate change and sea-level rise are addressed in Section 3.8, Water Resources and Water Quality.

3.14.2 Affected Environment

Greenhouse Gases, Global Warming, and Climate Change

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the Earth's surface, the atmosphere itself, and by clouds (IPCC 2013). The greenhouse effect is like the Earth and the atmosphere surrounding it being within a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) keep the average surface temperature of the Earth close to 60 degrees Fahrenheit (°F). Without the greenhouse effect, the Earth would be a frozen globe with an average surface temperature of about 5°F.

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. One aspect of climate change is global warming, which refers to the recent and ongoing rise in average global temperature near the Earth's surface. It is caused mostly by increasing concentrations of GHGs in the atmosphere. Global warming affects global atmospheric circulations and temperatures, oceanic circulations and temperatures, wind and weather patterns, average sea level, ocean acidification, chemical reaction rates, precipitation rates, timing, and form, snowmelt timing and runoff flow, water supply, and wildfire risks. Rising global temperatures are accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves. The planet's oceans and glaciers have also experienced changes: Oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising.

Types of Greenhouse Gases

In addition to CO_2, CH_4, and N_2O, GHGs include hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and water vapor. According to a Climate Action Team Report prepared for the State Governor and Legislature, CO_2 is the most abundant pollutant that contributes to climate change through fossil fuel combustion (DOE 1996). CO_2 comprised 81 percent of the total GHG emissions in California in 2002, and non-fossil fuel CO_2 comprised 2.3 percent (CalEPA 2006). The other GHGs are less abundant but have higher global warming potential than CO_2.

To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as CO_2e. CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse

effect. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 23 tons of CO_2. Therefore, CH_4 is a more potent GHG than CO_2. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. The CO_2e of CH_4 and N_2O represented 6.4 and 6.8 percent, respectively, of the 2002 California GHG emissions. Other high GWP gases represented 3.5 percent of these emissions (CalEPA 2006). In addition, a number of human-caused pollutants such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds, and sulfur dioxide have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other climate-change emissions.

Sources of Greenhouse Gas Emissions

Emissions of GHGs contributing to global climate change are attributable, in large part, to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors (IPCC 2013). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Emissions of CO_2 are by-products of fossil fuel combustion (CARB 2014). CH_4, a highly potent GHG, results from off-gassing (i.e., the release of chemicals from non-metallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management (EPA 2010). CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration (EPA 2012).

California produced 474 million gross metric tons of CO_2e averaged over the period from 2002 to 2004. Combustion of fossil fuel in the transportation sector was identified as the single largest source of California's GHG emissions in 2002 to 2004, accounting for 38 percent of total GHG emissions in the state. This sector was followed by the electric power sector (including both in-state and out-of-state sources) (18 percent) and the industrial sector (21 percent) (CARB 2011).

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies related to climate change and GHGs.

International

Intergovernmental Panel on Climate Change

The IPCC is the international body for assessing the science related to climate change. The IPCC was set up in 1988 by the World Meteorological Organization and United Nations Environment Programme to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. IPCC assessments provide a scientific basis for governments at all levels to develop climate-related policies, and they underlie negotiations at the United Nations Climate Conference – the United Nations Framework Convention on Climate Change.

The Fifth Assessment Report consists of three Working Group Reports and a Synthesis Report (IPCC 2013). The three Working Group Reports include The Physical Science Basis, Impacts, Adaptation and Vulnerability, Mitigation of Climate Change. The Synthesis Report has not been completed. The Physical Science Basis Working Group Report considers new evidence of climate change based on many independent scientific analyses from observations of the climate system, paleoclimate archives, theoretical studies of climate processes, and simulations using climate models. Key findings of the

Physical Science Basis Working Group Report are incorporated here by reference and are available at: http://www.climatechange2013.org/. Of note for this SEIS/EIR are the following report conclusions:

- Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983–2012 was likely the warmest 30-year period of the last 1,400 years.

- The rate of sea-level rise since the mid-19th century has been greater than the mean rate during the previous two millennia. Over the period 1901 to 2010, global mean sea level rose by 0.19 meter (0.17 to 0.21 meter).

- Global mean sea level will continue to rise during the 21st century. The rate of sea-level rise will likely exceed that observed during 1971 to 2010 due to increased ocean warming and increased loss of mass from glaciers and ice sheets.

The Impacts, Adaptation and Vulnerability, Mitigation of Climate Change Working Group Report examines the risks that climate change presents for human and natural systems. It recognizes that risks of climate change will vary across regions and populations, through space and time, dependent on myriad factors, including the extent of mitigation and adaptation. The Mitigation of Climate Change Working Group Report assesses literature on the scientific, technological, environmental, economic, and social aspects of mitigation of climate change. The report states that the last two decades have seen relatively active efforts around the world to design and adopt policies that control (mitigate) the emissions of pollutants that affect the climate. The effects of emissions are global; therefore, mitigation involves international coordination among nations. Local, national, and international policies have included market-based approaches such as emissions trading systems, regulation, and voluntary initiatives. International diplomacy—leading to agreements such as the United Nations Framework Convention on Climate Change and the Kyoto Protocol, as well as various complementary initiatives such as the commitments pledged at the Copenhagen and Cancun Conferences of the Parties—has played a role in focusing attention on mitigation of GHGs.

Federal

U.S. Environmental Protection Agency

The United States Environmental Protection Agency (EPA) is the federal agency responsible for implementing the Clean Air Act. The U.S. Supreme Court ruled in its decision in *Massachusetts* et al. v. *Environmental Protection Agency* et al. ([2007] 549 U.S. 05-1120), issued on April 2, 2007, that CO_2 is an air pollutant as defined under the Clean Air Act, and that the EPA has the authority to regulate emissions of GHGs. In response to the mounting issue of climate change, the EPA has taken actions to regulate, monitor, and potentially reduce GHG emissions.

Mandatory Greenhouse Gas Reporting Rule. On September 22, 2009, the EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement provides the EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. Reporting is required at the facility level, except that certain suppliers of fossil fuels and industrial GHGs, along with vehicle and engine manufacturers, report at the corporate level. An estimated 85 percent of the total GHG emissions in the U.S. from approximately 10,000 facilities are covered by this final rule (BAAQMD 2010).

Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. On April 23, 2009, the EPA published its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act (Endangerment Finding) in the Federal Register.

The EPA Administrator proposed the finding that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the Clean Air Act. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea-level rise, and higher-intensity storms) are a threat to the public health and welfare.

The EPA Administrator also proposed the finding that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. The proposed finding cites that, in 2006, motor vehicles were the second-largest contributor to domestic GHG emissions (24 percent of total) behind electricity generation. Furthermore, in 2005, the U.S. was responsible for 18 percent of global GHG emissions (BAAQMD 2010). Therefore, GHG emissions from motor vehicles and motor vehicle engines were found to contribute to air pollution that endangers public health and welfare.

Council on Environmental Quality Guidelines

On December 18, 2014, the Council on Environmental Quality (CEQ) released revised draft guidance that describes how federal departments and agencies should consider the effects of GHG emissions and climate change in their NEPA reviews. The revised draft guidance supersedes the draft GHG and climate change guidance released by CEQ in February 2010. This draft guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action (CEQ 2014). It recommends that agencies consider 25,000 metric tons of CO_2e emissions on an annual basis as a reference point below which a quantitative analysis of GHG is not recommended unless it is easily accomplished based on available tools and data. Unlike the 2010 draft guidance, the revised draft guidance applies to all proposed federal agency actions, including land and resource management actions. It instructs agencies on how to address the GHG emissions from, and the effects of, climate change on their proposed actions within the existing NEPA regulatory framework and to use the GHG information to identify more resilient alternatives.

State

CEQA Guidelines Amendments

Senate Bill (SB 97), signed by the governor of California in August 2007, acknowledged climate change as a prominent environmental issue that requires analysis under CEQA. In accordance with SB 97, the California Natural Resources Agency (CNRA) adopted new or revised CEQA Guidelines (Sections 15064.4, 15126.2, 15126.4, 15183.5, 15364.5) on December 31, 2009, requiring lead agencies in California to analyze GHG emissions as part of CEQA review, and CEQA Guidelines Appendix G, Section VII (Greenhouse Gas Emission). Among these amendments to the CEQA Guidelines are the following:

- Lead agencies must analyze the GHG emissions of proposed projects, and must reach a conclusion regarding the significance of those emissions (CEQA Guidelines Section 15064.4).

- When a project's GHG emissions may be significant, lead agencies must consider feasible means of mitigating the significant effects of greenhouse gas emissions, including the types of measures listed in the Guidelines (CEQA Guidelines Section 15126.4[c]).

- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply, and ways to reduce energy demand, including through

the use of efficient transportation alternatives (CEQA Guidelines, Appendix F), as well as energy conservation measures (CEQA Guidelines Section 15126.4(a)(1)(C)).

Executive Order S-3-05

On June 1, 2005, EO S-3-05 set the following GHG emissions reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. EO S-3-05 calls for the Secretary of the California Environmental Protection Agency (CalEPA) to be responsible for coordination of state agencies and progress reporting. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should be major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency (CEC 2013).

In response to EO S-3-05, the Secretary of the CalEPA created the Climate Action Team (CAT), including the Secretaries of the Natural Resources Agency and the Department of Food and Agriculture, and the Chairs of the California Air Resources Board (CARB), California Energy Commission, and California Public Utilities Commission. The original mandate for the CAT was to develop measures to meet the emissions reduction targets set forth in EO S-3-05. The CAT has since expanded, and currently has members from 18 state agencies and departments.

Assembly Bill 32, California Global Warming Solutions Act

The California Global Warming Solutions Act of 2006, also known as AB 32, was enacted in 2006. AB 32 focuses on reducing GHG emissions in California, and requires the CARB to adopt rules and regulations that would reduce GHG emissions to 1990 levels statewide by 2020. To achieve this goal, AB 32 mandated that the CARB establish a quantified emissions cap; institute a schedule to meet the cap; implement regulations to reduce statewide GHG emissions from stationary sources; and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of AB 32 is to limit 2020 emissions to the equivalent of 1990 levels, the regulations affect many existing sources of GHG emissions and not just new general development projects. The CARB initially determined that the total statewide aggregated GHG 1990 emissions level and 2020 emissions limit was 427 million metric tons of CO_2e. Based on the estimated GHG emissions inventory, the state was mandated to reduce GHG emissions by 174 million metric tons by 2020 (CARB 2011).

AB 32 Climate Change Scoping Plan

The CARB AB 32 Climate Change Scoping Plan contains the main strategies to achieve the 2020 emissions goal. The Scoping Plan was developed by the CARB with input from the CAT and includes direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The initial key approaches for reducing GHG emissions to 1990 levels by 2020 were as follows:

- Expand and strengthen existing energy efficiency programs and building and appliance standards.
- Achieve a statewide renewable electricity standard of 33 percent.
- Develop a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system.
- Establish targets for transportation-related GHG emissions for regions throughout California, and pursue policies and incentives to achieve those targets.

- Adopt and implement measures to reduce transportation sector emissions, including California's clean car standards and the LCFS.

In February 2014, the CARB released the Proposed First Update to the Climate Change Scoping Plan (CARB 2014). As part of the Scoping Plan Update, the CARB is proposing to revise the 2020 statewide limit to 431 million metric tons of CO_2e, an approximately 1 percent increase from the original estimate. The 2020 business-as-usual forecast in the Scoping Plan Update is 509 million metric tons of CO_2e. The state would need to reduce those emissions by 15 percent to meet the 431 million metric tons of CO_2e 2020 limit.

The CARB also developed the GHG mandatory reporting regulation, which required reporting beginning on January 1, 2008, pursuant to the requirements of AB 32. The regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. The regulation language identifies major facilities as those that generate more than 25,000 metric tons of CO_2 per year. Cement plants, oil refineries, electric-generating facilities/providers, co-generation facilities, hydrogen plants, and other stationary combustion sources that emit more than 25,000 metric tons of CO_2 per year make up 94 percent of the point sources of CO_2 emissions in California.

Executive Order S-1-07

Signed in 2007, EO S-1-07 proclaimed the transportation sector as the main source of GHG emissions in California. The executive order states that the transportation sector accounts for more than 40 percent of statewide GHG emissions. The order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

Senate Bill 375

SB 375, adopted on September 30, 2008, provides a means for achieving AB 32 goals through the reduction in emissions of cars and light trucks. SB 375 requires new Regional Transportation Plans (RTPs) to include Sustainable Communities Strategies (SCSs). This legislation also allows the development of an Alternative Planning Strategy (APS) if the targets cannot be feasibly met through an SCS. The APS is not included as part of the RTP. In adopting SB 375, the state legislature expressly found that improved land use and transportation systems are needed in order to achieve the GHG emissions reduction target of AB 32.

The CARB is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. The CARB is also charged with reviewing each SCS or APS for consistency with its assigned GHG emissions reduction targets.

In compliance with SB 375, the Association of Bay Area Governments and the Metropolitan Transportation Commission Executive Boards jointly approved the final Plan Bay Area in December 2013 (ABAG and MTC 2013). The Plan Bay Area is further discussed below under regional regulations.

Executive Order S-13-08

Signed on November 14, 2008, EO S-13-08 directed California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directed by the OPR, in cooperation with the CNRA, to provide land use planning guidance related to sea-level rise and other climate change impacts. The order also directed the CNRA to develop a State Climate Adaptation Strategy and to convene an independent panel to complete the first California Sea-Level Rise Assessment

Report. The CNRA released the Third Climate Change Assessment in 2009, and is in the process of updating the 2009 California Climate Adaption Strategy.

Public Resources Code Section 21094.5.5(b)(3)

Effective January 1, 2012, this section of the Public Resources Code required statewide standards for infill projects that promote the reduction of GHG emissions under the California Global Warming Solutions Act of 2006.

Executive Order B-30-15

Signed April 29, 2015, EO B-30-15 establishes a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 to ensure California meets its target of an 80 percent reduction below 1990 levels by 2050. The executive order also requires incorporating climate change impacts into the state's Five-Year Infrastructure Plan, updating the Safeguarding California Plan, factoring climate change into state agencies' planning and investment decisions, continuing the state's climate change research program, and implementing measures under existing agency and departmental authority to reduce GHG emissions.

Regional

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of GHGs and reducing air pollutants that affect the health of residents. The BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

Metropolitan Transportation Commission/Association of Bay Area Governments

The Metropolitan Transportation Commission and Association of Bay Area Governments Executive Boards jointly approved Plan Bay Area, which includes the region's SCS and 2040 RTP. Plan Bay Area is an integrated long-range transportation and land-use/housing plan that supports a growing economy, provides more housing and transportation choices, and reduces transportation-related pollution in the San Francisco Bay Area. With the region's population expected to grow from approximately 7 million in 2011 to approximately 9 million in 2040, Plan Bay Area concluded that it is critical to make transportation, housing, and land use decisions now to sustain the Bay Area's quality of life (ABAG and MTC 2013).

Plan Bay Area addresses SB 375, which requires reductions in GHG emissions from cars and light trucks (ABAG and MTC 2013). The mechanism for achieving these reductions is an SCS that promotes compact, mixed-use commercial and residential development that is walkable and bike-able, and close to mass transit, jobs, schools, shopping, parks, recreation, and other amenities. Plan Bay Area contains goals, policies, and objectives that encourage more transportation choices, creates more livable communities, and reduces the pollution that contributes to climate change.

Local

San Francisco Planning Code

The San Francisco Planning Code includes smart growth policies such as electric vehicle refueling stations in City parking garages, bicycle storage facilities for commercial and office buildings, and zoning

that is supportive of high-density mixed-use infill development. There is a communitywide focus on ensuring that San Francisco's neighborhoods are "livable," reflected in the San Francisco Better Streets Plan, which provides streetscape policies for throughout the City; the Transit Effectiveness Project, which aims to improve transit service; and the San Francisco Bicycle Plan. All of these plans and projects are intended to promote alternative transportation for residents and visitors.

Local GHG Reduction Strategy

The San Francisco Department of the Environment and the San Francisco Public Utilities Commission prepared the Climate Action Plan (CAP) for San Francisco, Local Actions to Reduce Greenhouse Gas Emissions, which was designed to meet standards established by the BAAQMD. The CAP provides background climate change information, presents estimates of San Francisco's baseline GHG emissions inventory and reduction target, describes recommended emissions reduction actions in key target sectors, and presents next steps to implement the CAP. On October 28, 2010, the BAAQMD wrote a letter approving the CAP. Consequently, projects found to be consistent with the CAP do not need to take any further actions with regard to climate change or GHG emissions.

The City Strategies to Address Greenhouse Gas Emissions presents an assessment of policies, programs, and ordinances that collectively represent San Francisco's qualified GHG reduction program in compliance with the BAAQMD's recommendations (City and County of San Francisco 2010). The Strategies to Address Greenhouse Gas Emissions identifies a number of actions that the City has taken in support of the CAP, and mandatory requirements and incentives that have measurably reduced GHG emissions. These include increases in the energy efficiency of new and existing buildings, installation of solar panels on building roofs, implementation of a "green building" strategy, adoption of a zero waste strategy, implementation of a construction and demolition debris recovery ordinance, implementation of a solar energy generation subsidy, incorporation of alternative fuel vehicles in the municipal transportation fleet (including buses and taxis), and implementation of a mandatory composting ordinance. The strategy also identifies 42 specific regulations for new development that would reduce a project's GHG emissions.

Greenhouse Gas Reduction Ordinance

In 2008, the City amended the San Francisco Environment Code to establish GHG emissions reduction targets and departmental action plans, and to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets and to make environmental findings. The ordinance established the following GHG emissions reduction limits for San Francisco and the target dates by which they must be achieved:

- Determine 1990 City GHG emissions, the baseline level to which target reductions are set.
- Reduce GHG emissions by 25 percent below 1990 levels by 2017, 40 percent below 1990 levels by 2025, and 80 percent below 1990 levels by 2050.

The San Francisco Department of the Environment identified 1990 communitywide CO_2 emissions as 6,201,949 metric tons (San Francisco Department of the Environment 2014). Estimated 2010 emissions were 5,299,757 metric tons, which is a 14.5 percent reduction from 1990 levels.

3.14.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

This analysis evaluates the proposed project to determine if GHG and climate change impacts would occur. For this SEIS/EIR, and in accordance with Appendix G of the CEQA Guidelines, the proposed

project would have a potentially significant impact related to GHG emissions if it were to do either of the following:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or

- conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

To provide guidance on how to interpret the first threshold, the BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of GHG impacts of projects and plans proposed within the Bay Area. The guidelines include recommended assessment methodologies for GHG emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update to the CEQA Guidelines. As described in Section 3.13, Air Quality, these guidelines were legally challenged. Following rulings by the Superior Court and the Court of Appeal, and a petition for review to the California Supreme Court, only the status of the thresholds for toxic air contaminants remains in doubt as of the publication of this SEIS-EIR.

Therefore, the subsequent case history summarized in Section 3.13, Air Quality, and the science and reasoning contained in the BAAQMD 2011 CEQA Air Quality Guidelines provide the latest state-of-the-art guidance available. For that reason, substantial evidence supports continued use of the BAAQMD 2011 CEQA Air Quality Guidelines. Accordingly, this SEIS/EIR uses the following thresholds of significance, which are the BAAQMD's 2011 thresholds, to evaluate the potential effects of the proposed project relating to greenhouse gas emissions: compliance with a qualified GHG reduction strategy or 1,100 metric tons of CO_2e per year. The analysis considers the overall GHG emissions as well as San Francisco's Strategies to Address Greenhouse Gas Emissions as the relevant GHG reduction plan.

Related to NEPA, the Council on Environmental Quality issued revised draft guidance on GHG emissions. The draft guidance states that direct emissions from a proposed action of 25,000 metric tons per year of CO_2e can be used as a reference point, below which a GHG analysis is not warranted unless quantification below that reference point is easily accomplished (CEQ 2014). This threshold is not to be interpreted as signaling whether an effect is significant or not; it is simply a reference point recommended by CEQ for the level of analysis that should be directed towards a proposed action. GHG emissions were estimated using a similar methodology as described in Section 3.13, Air Quality, for criteria pollutants.

Environmental Analysis

No Action Alternative

There was no specific reference to GHG and climate change in the 2004 FEIS/EIR, which was common for NEPA documents prepared at that time. The 2010 Transbay Program FEIS Reevaluation by the Federal Railroad Administration (2010 Reevaluation) did update the 2004 FEIS/EIR to address GHG and climate change. The FRA Reevaluation reports that implementation of the HSR service would reduce CO_2 emissions by about 3,375,155 tons/year, which is a beneficial effect.

Under the No Action Alternative, the Transbay Program will be constructed as previously approved, and the proposed project as described in this SEIS/EIR would not be implemented. Both construction and operational activities associated with the No Action Alternative will affect regional GHG emissions.

Construction GHG Emissions. The 2004 FEIS/EIR did not quantify GHG emissions; hence, the information necessary for a GHG analysis (e.g., phasing schedule and equipment list) was not prepared at that time. For this SEIS/EIR, a program-level GHG analysis was performed using the primary sources of

construction-related GHG emissions (i.e., equipment and truck exhaust) identified for the entire Transbay Program. The 2004 FEIS/EIR included a total excavated volume of 2,436,000 cubic yards of soil, which has been converted into 243,600 truck trips by using a truck capacity of 10 cubic yards. The truck emissions analysis also included a roundtrip distance of 25 miles and the 2015 EMFAC2011 emissions factor for a heavy-duty truck. The trip distance was based on the information provided by the project team that stated that haul trucks will travel 10 miles roundtrip, delivery trucks will travel 16 miles roundtrip, and concrete trucks will travel 50 miles roundtrip. This analysis uses the average of the three trip distances to estimate truck emissions. Equipment exhaust emissions were estimated using eight general pieces of construction equipment operating 8 hours per day for 53 months. These assumptions resulted in total CO_2e construction emissions of 6,662 metric tons over the 53-month construction process.

Operational GHG Emissions. Regarding operational emissions, the No Action Alternative will extend rail service from the terminus at Fourth and Townsend Streets into San Francisco's employment core. A detailed analysis was prepared in 2008, after the 2004 FEIS/EIR was completed, to determine projected train ridership associated with the Downtown Rail Extension (DTX) (TJPA 2008). The analysis was prepared to update ridership information for use in preliminary engineering, and to consider effects of operation of the DTX on air quality and climate change. This data represents the best available information for DTX, including the Peninsula Corridor Electrification Project, which did not include extending electrified rail to the new Transit Center but evaluated service terminating at the existing Fourth and King Street Caltrain Station.

A range of ridership forecasts was presented in the 2008 TJPA study based on variables such as the price of gas and the rate of redevelopment. The scenario with no redevelopment and the cost of gas at $3.50 per gallon was estimated to generate the lowest ridership of 29,700 passengers. This conservative ridership was used in this assessment of the operational GHG impacts of the No Action Alternative.

The detailed DTX ridership analysis determined that the 29,700 passengers arriving and departing at the Transit Center will reduce vehicle miles traveled (VMT) in San Francisco by 122,800 miles. The regional VMT reduction, including San Mateo and Santa Clara Counties, will be 259,700 miles. GHG emissions are directly emitted by passenger vehicles powered by fossil fuels. The detailed ridership analysis also presented CO_2 emissions associated with the VMT reductions. It was determined that the 122,800 VMT decrease will reduce CO_2 emissions in San Francisco by 48 metric tons per day (106,300 pounds per day), and will reduce regional emissions by 102 metric tons per day (225,000 pounds per day). A simplified annualization of the CO_2 emissions results in a passenger vehicle CO_2 reduction in San Francisco of 17,520 metric tons per year, and regional reduction of 37,230 metric tons per year.

The GHG estimates presented above were updated using emissions factors from EMFAC2011 and OFFROAD2011. They were also updated to account for CH_4 and N_2O emissions, in addition to CO_2 emissions. Based on the updated analysis, the DTX will result in GHG reductions in San Francisco of 14,860 metric tons per year, and a regional reduction of 31,427 metric tons per year.

In addition to the DTX study, other ridership studies and GHG analyses have been completed for DTX. For example, the Peninsula Corridor Electrification Project estimated that implementation of that project would increase 2020 daily ridership from 57,000 to 69,000 and 2040 daily ridership from 84,000 to 111,000. The resulting analysis demonstrated a 67,709 metric ton CO_2e reduction in 2020 and a 176,783 metric ton CO_2e reduction in 2040. Regardless of the associated ridership study and year of analysis, implementation of the DTX results in increased Caltrain ridership, which results in regional GHG emission reductions.

Net Effects. The short-term increase in GHG emissions associated with construction will be offset by the long-term benefit associated with the operational component of the No Action Alternative. Net San

Francisco CO_2e emissions will be reduced by approximately 8,198 metric tons per year and net regional emissions by about 24,765 metric tons per year. Therefore, the No Action Alternative will substantially reduce GHG emissions and result in an environmental benefit.

Potential GHG emissions reductions resulting from implementation of the HSR will not occur with the No Action Alternative, because components of the proposed project, in particular the widened throat structure and the extended train box, will be necessary to allow implementation of HSR service to the Transit Center.

Proposed Project

As discussed above, the OPR has issued guidance that the effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see State CEQA Guidelines Section 15064.4; also see Bay Area Air Quality Management District, June 2010 CEQA Guidelines, Appendix D, Section 2.2). Therefore, the following analysis of the proposed project's impact on climate change focuses on the proposed project's contribution to cumulatively significant GHG emissions.

Impact CU-CC-1: The proposed project would not generate significant GHG emissions resulting in a significant environmental impact. (Beneficial Effect/Beneficial Impact)

The most common GHGs resulting from human activity associated with land use decisions are CO_2, black carbon, CH_4, and N_2O (Office of Planning and Research 2008). Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operation. Direct operational emissions include GHGs from new vehicle trips and area sources (natural gas combustion). Indirect emissions include emissions from electricity providers; energy required to pump, treat, and convey water; and emissions associated with landfill operations.

GHG emissions related to the proposed project would result from implementation of the refinements to Phase 2 of the Transbay Program, other transportation improvements, and land development. These proposed project components include changes to the DTX track curvature entering the train box, extension of below-grade rail levels of the Transit Center, and other improvements necessary for implementing the Transbay Program and enhancing local and regional connectivity and accessibility.

The proposed project would not alter the operating plans for Caltrain or HSR service. The approved Transbay Program was intended to enable both Caltrain and HSR service; however, the 2004 FEIS/EIR was certified before final HSR design specifications were adopted by the California High-Speed Rail Authority. The proposed widened throat structure and extended train box are necessary to conform to the California High-Speed Rail Authority standards. The proposed project components are needed to achieve the GHG benefits described in the 2010 FRA Reevaluation for HSR service (FRA 2010).

Other proposed project components related to the DTX (including, for example, realigning the Fourth and Townsend Street Station, the vent structures, the tunnel stub box, and the use of rock dowels during tunnel construction) would not change the operations, regional vehicle miles traveled, or water and energy consumption discussed in the 2004 FEIS/EIR, and, consequently, would not substantially affect the GHG reductions gained from changes in regional travel patterns.

Other transportation improvements and the land development opportunities that are envisioned to co-locate with some of the proposed project transportation components would result in negligible GHG emissions, and would promote increased use of alternative transportation modes over single-occupancy motor vehicles. The intercity bus facility would provide shuttle and transit services that would connect the regional transit network to major employment centers. In particular, the intercity bus facility would serve existing Greyhound and Amtrak bus services, and would support existing regional transit that contributes to reduced regional passenger vehicle miles traveled. The taxi staging area and AC Transit bus storage facility parking

would not generate substantial new vehicle trips and associated GHG emissions. The bicycle/controlled vehicle ramp and underground pedestrian connector are non-motorized improvements that would not generate emissions; both would foster bicycle and pedestrian circulation.

A study by the U.S. Department of Transportation based on transit system data from throughout the U.S. found that, on average, public diesel-fueled buses produced 33 percent less GHG emissions per passenger mile than the average single-occupancy vehicle (DOT 2010). The savings increased to 82 percent for a typical diesel transit bus when it is carrying at least 40 passengers (DOT 2010). The local and regional GHG reduction strategies recognize that improvements in public transit service and efficiency would result in an increase in the number of passengers who otherwise would be using privately owned passenger vehicles. For instance, San Francisco's CAP indicates that the major way to reduce transportation-sector GHG emissions is to reduce vehicle trips by encouraging a shift from driving to alternative modes, such as public transit (San Francisco Department of the Environment and San Francisco Public Utilities Commission 2004). The proposed project would result in an increase in the number of transit passengers who would otherwise use privately owned vehicles.

The GHG emissions reductions associated with the implementation of HSR service would be in addition to the reductions identified for the No Action Alternative, which only accounts for benefits attributable to the extended Caltrain service. Estimates of the additional benefit from the proposed project, which would enable HSR service, were presented in the 2010 FRA Reevaluation of the 2004 FEIS/EIR. The reevaluation reports that implementation of the HSR service would reduce CO_2 emissions by about 3,375,155 tons/year. The proposed project would enable a portion of those benefits to be realized in the San Francisco Bay Area and further contribute to the GHG emissions reductions of the No Action Alternative.

Regarding construction emissions from the proposed project, construction activities would generate air emissions from various sources, including heavy-duty equipment engines, truck engines, and worker commute vehicles. Refer to Section 2.2.2, Proposed Project, and Table 2-5 of this SEIS/EIR for a detailed description of construction activities. A detailed analysis was prepared using construction equipment and scheduling assumptions from the TJPA. Construction emissions were estimated using the OFFROAD model for heavy-duty equipment emissions rates and EMFAC2011 for truck exhaust emissions rates. The truck emissions analysis used the year 2015 emission factors from EMFAC2011 for heavy-duty trucks. As under the No Action Alternative, the trip distance was based on the information provided by the project team stating that haul trucks would travel 10 miles roundtrip, delivery trucks would travel 16 miles roundtrip, and concrete trucks would travel 50 miles roundtrip. This analysis uses the average of the three trip distances to estimate truck emissions. Equipment exhaust emissions were estimated using various pieces of construction equipment (e.g., excavator, backhoe, pile rig, cranes depending on the construction phase) operating 8 hours per day for approximately 45 months. The analysis showed 8,939 metric tons per year (19,707,125 pounds per year) of construction-related GHG emissions. This short-term increase in GHG emissions would be offset by the long-term benefit associated with the operational component of the proposed project.

Consistent with the State CEQA Guidelines and BAAQMD recommendations for analyzing GHG emissions under CEQA, potential impacts associated with the proposed adjacent land development and other proposed project components were assessed using San Francisco's Strategies to Address Greenhouse Gas Emissions. The City uses two checklists, one for municipal projects and one for private development projects, to evaluate compliance with the City's GHG reduction policies. Both checklists have been applied to this analysis due to the combination of agency-led transportation improvements and proposed adjacent land development. As shown in Tables 3.14-1 and 3.14-2, the proposed project complies with San Francisco's Strategies to address Greenhouse Gas Emissions and would not generate significant GHG emissions (i.e., 25,000 metric tons per year or more).

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
Transportation Sector			
Commuter Benefits Ordinance (San Francisco Environment Code, Section 421)	All employees are offered commuter benefits for transit and vanpool expenses.	Project Complies	Employees hired as a result of this project would be eligible for commuter benefits under the existing ordinance. Additionally, employees would not be charged to use the Muni system. The proposed project would not include any specific actions that would interfere with any existing policies or practices related to implementation of the Commuter Benefits Ordinance.
Emergency Ride Home Program	All employees are automatically eligible for the emergency ride home program.	Project Complies	Employees hired as a result of this project would be automatically eligible for the Emergency Ride Home Program. The proposed project would not include any specific actions that would interfere with any existing policies or practices related to the implementation of the Emergency Ride Home Program.
Healthy Air and Smog Ordinance (San Francisco Environment Code, Chapter 4)	Requires all new purchases or leases of passenger vehicles and light-duty trucks to be the cleanest and most efficient vehicles available on the market. Also requirements for medium- and heavy-duty vehicles	Not Applicable	The proposed project would not include the purchase or lease of new vehicles.
Biodiesel for Municipal Fleets (Executive Directive 06-02)	Requires all diesel vehicles to begin using 20% biodiesel blend (B20). Set goals for all diesel equipment to be run on biodiesel by 2007 and for increasing biodiesel blends to 100%.	Not Applicable	The proposed project would not include the purchase or lease of new vehicles. However, the proposed project would provide bus bays for vehicles that are powered with B20.
Clean Construction Ordinance (San Francisco Administrative Code, Section 6.25)	Effective March 2009, all contracts for large (20-plus-day) projects are required to fuel diesel vehicles with B20 biodiesel and use construction equipment that meets EPA Tier 2 standards or best available control technologies for equipment over 25 horse power.	Project Complies	The proposed project's construction activities would be performed in accordance with the Clean Construction Ordinance. Contract specifications would include the requirement for B20 biodiesel and Tier 2 construction equipment or best available control technology for diesel exhaust emissions.
Bicycle Parking in City-Owned and Leased Buildings (Planning Code, Section 155.1)	Class 1 and 2 Bicycle Parking Spaces Class 1 Requirements: (A) Provide two spaces in buildings with one to 20 employees. (B) Provide four spaces in buildings with 21 to 50 employees. (C) In buildings with 51 to 300 employees, provide bicycle parking equal to at least	Project Complies	The proposed project calls for a 500-bicycle storage facility, with room to potentially double this number. Bicycle storage is intended for all users of the Transit Center, and has sufficient capacity to accommodate demand

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
	5% of the number of employees at that building, but no fewer than five bicycle spaces. (D) In buildings with more than 300 employees, provide bicycle parking equal to at least 3% of the number of employees at that building, but no fewer than 16 bicycle spaces. In addition to the Class 1 bicycle parking spaces, provide Class 2 bicycle parking. Class 2 requirements: (A) In buildings with one to 40 employees, provide at least two bicycle parking spaces. (B) In buildings with 41 to 50 employees, provide at least four bicycle parking spaces. (C) In buildings with 51 to 100 employees, provide at least six bicycle parking spaces. (D) In buildings with more than 100 employees, provide at least eight bicycle parking spaces. Wherever eight or more Class 2 bicycle parking spaces are required, at least 50% of those parking spaces shall be covered.		from future Caltrain and high-speed train passengers.
Bicycle Parking in Parking Garages (Planning Code, Section 155.2)	(A) Every garage will supply a minimum of six bicycle parking spaces. (B) Garages with between 120 and 500 automobile spaces shall provide one bicycle space for every 20 automobile spaces. (C) Garages with more than 500 automobile spaces shall provide 25 spaces plus one additional space for every 40 automobile spaces over 500 spaces, up to a maximum of 50 bicycle parking spaces.	Project Complies	The proposed project calls for a 500-bicycle storage facility, with room to potentially double this number. Bicycle storage is intended for all users of the Transit Center, and has sufficient capacity to accommodate demand from future Caltrain and high-speed train passengers.
Transportation Management Program (Planning Code, Section 163)	Requires new buildings or additions over a specified size (buildings >25,000 square feet or 100,000 square feet depending on the use and zoning district) within certain zoning districts (including downtown and mixed-use districts in the eastern neighborhoods and south of market) to implement a Transportation Management Program and provide on-site transportation management brokerage services for the life of the building.	Project Complies	Future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility will be conditioned to comply with the City's Transportation Management Program.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
Energy Efficiency Sector			
Green Building Requirements for City Buildings: Indoor Water Use Reduction (San Francisco Environment Code, Chapter 7)	The Leadership in Energy and Environmental and Design (LEED) Project Administrator shall submit documentation verifying a minimum 30% reduction in the use of indoor potable water, as calculated to meet and achieve LEED credit WE3.2.	Project Complies	The proposed project would be subject to and would comply with this regulation.
Resource Efficiency and Green Building Ordinance (Environment Code, Chapter 7)	All new construction must comply with and achieve, at a minimum, the LEED Gold standard. City leaseholds are subject to all of the requirements of the Commercial Water Conservation Ordinance of Chapter 13A of the San Francisco Building Code, including provisions requiring the replacement of non-compliant water closets and urinals on or before January 1, 2017. (1) All water closets (toilets) with a rated flush volume exceeding 1.6 gallons per flush and all urinals with a rated flush volume exceeding 1.0 gallon per flush must be replaced with high-efficiency water closets that use no more than 1.28 gallons per flush and high-efficiency urinals that use no more than 0.5 gallon per flush, respectively. (2) Showerheads must use no more than 1.5 gallons per minute (gal/min). In addition, all showerheads in the facility having a maximum flow rate exceeding 2.5 gal/min must be replaced with showerheads that use no more than 1.5 gal/min. (3) All faucets and faucet aerators in the facility with a maximum flow rate exceeding 2.2 gal/min are to be replaced with fixtures having a maximum flow rate not to exceed 0.5 gal/min, per appropriate site conditions.	Project Complies	Future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would comply with the City's Resource Efficiency and Green Building Ordinance.
Green Building Requirements for City Buildings: Energy Efficient Lighting Retrofit Requirements (San Francisco Environment Code, Chapter 7)	These requirements (or those in CCR Title 24, Part 6, or subsequent state standards, whichever are more stringent) shall apply in all cases except those in which a City department is not responsible for maintenance of light fixtures or exit signs. **Exit Signs:** At the time of installation or replacement of broken or non-functional exit signs, all exit signs shall be replaced with light-emitting diode (LED)-type signs. Edge-lit compact fluorescent signs	Project Complies	The land development proposed project component would be conditioned to comply with this regulation and the City's Energy Efficient Lighting Retrofit Requirements.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
	may be used as replacements for existing edge-lit incandescent exit signs. **Fluorescent Fixtures - Mercury Content:** The mercury content of each 4-foot- or 8-foot-long fluorescent lamp ("tube" or "bulb") installed in a luminaire shall not exceed 5 milligrams (mg) for each 4-foot fluorescent lamp, or 10 mg for each 8-foot fluorescent lamp. **Fluorescent Fixtures - Energy Efficiency:** The lamp and ballast system in each luminaire that uses one or more 4-foot- or 8-foot-long linear fluorescent lamp to provide illumination in a City-owned facility must meet the specified requirements. **Exterior Light Fixtures:** At the time of installation or replacement of broken or non-functional exterior light fixtures, a photocell or automatic timer shall be installed to prevent lights from operating during daylight hours.		
Green Building Requirements for City Buildings: Energy Performance (San Francisco Environment Code, Chapter 7)	Using an Alternative Calculation Method approved by the California Energy Commission, the LEED Project Administrator shall calculate the project's energy use and compare it to the standard or "budget" building to achieve LEED credit EA1 by either: (A) a 15% compliance margin over Title 24, Part 6, 2008 California Energy Standards; or (B) document compliance with Title 24, Part 6, 2008 California Energy Standards, including submittal of all standard documentation, and additionally demonstrate that the project achieves a 15% or greater compliance margin over the ASHRAE 90.1 2007 energy cost baseline using the published LEED 2009 Rules.	Project Complies	The proposed project would be subject to and would comply with the Green Building Requirements for City Buildings – Energy Performance.
Green Building Requirements for City Buildings: Renewable Energy (San Francisco Environment Code, Chapter 7)	The LEED Project Administrator shall confer with the San Francisco Public Utilities Commission (SFPUC) on renewable energy opportunities for municipal construction projects. The LEED Project Administrator shall submit documentation verifying that either: (A) at least 1% of the building's energy costs are offset by on-site renewable energy generation, achieving LEED credit A 2, including any combination of: photovoltaic, solar thermal, wind, biofuel-based electrical systems, geothermal heating, geothermal	Project Complies	The proposed project would be subject to and would comply with the San Francisco Environmental Code, Green Building Requirements, Renewable Energy.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
	electric, wave, tidal, or low-impact hydroelectric systems, or as specified in Section 25741 of the California Public Resources Code; or (B) in addition to meeting LEED prerequisite EA 1 Energy Performance requirement, achieve an additional 10% compliance margin over Title 24, Part 6, 2008 California Energy Standards, for a total compliance margin of at least 25%.		
Green Building Requirements for City Buildings: Commissioning (San Francisco Environment Code, Chapter 7)	The LEED Project Administrator shall submit documentation verifying that the facility has been or will meet the criteria necessary to achieve LEED credit EA 3.0 (Enhanced Commissioning), in addition to LEED prerequisite EAp1 (Fundamental Commissioning of Building Energy Systems).	Project Complies	The proposed project would be subject to and would comply with this regulation.
Waste Reduction Sector			
Resource Efficiency and Green Building Ordinance (San Francisco Environment Code, Chapter 7)	The ordinance requires all demolition and new construction projects to prepare a Construction and Demolition Debris Management Plan designed to recycle construction and demolition materials to the maximum extent feasible, with a goal of 75% diversion. The ordinance specifies requirements for buildings to provide adequate recycling space.	Project Complies	Construction contract specifications for the proposed project components would include the requirement that the contractor prepare a Construction and Demolition Debris Management Plan to recycle demolition or other construction waste to the maximum extent possible, with a goal of 75% diversion.
Resource Conservation Ordinance (San Francisco Environment Code, Chapter 5)	This ordinance establishes a goal to (i) maximize purchases of recycled products and (ii) divert from disposal as much solid waste as possible so that the City can meet the state-mandated 50% division requirement. Each City department shall prepare a Waste Assessment. The ordinance also requires the Department of the Environment to prepare a Resource Conservation Plan that facilitates waste reduction and recycling. The ordinance requires janitorial contracts to consolidate recyclable materials for pick up. Lastly, the ordinance specifies purchasing requirements for paper products.	Project Complies	The proposed project would not alter any existing policies or practices to meet the requirements of Chapter 5 of the San Francisco Environment Code. The proposed project would comply with the Resource Conservation Ordinance for any actions, as applicable. Construction contract specifications would include the requirement that the contractor comply with the Resource Efficiency and Green Building Ordinance's goal of recycling 75% of construction waste and, therefore, would also comply with the Resource Conservation Ordinance goal of 50% waste diversion.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
Green Building Requirements for City Buildings: Recycling (San Francisco Environment Code, Chapter 7)	All City departments are required to recycle used fluorescent and other mercury-containing lamps, batteries, and universal waste as defined by California Code of Regulations Section 66261.9.	Project Complies	The proposed project would comply with the Green Building Requirements for City Buildings: Recycling regarding recycling of used fluorescent and other mercury-containing lamps, batteries, and universal waste.
Mandatory Recycling and Composting Ordinance (San Francisco Environment Code, Chapter 19)	The mandatory recycling and composting ordinance requires all persons in San Francisco to separate their refuse into recyclables, compostables, and trash, and place each type of refuse in a separate container designated for disposal of that type of refuse.	Project Complies	The proposed project would comply with the Mandatory Recycling and Composting Ordinance regarding treatment of refuse in separate containers.
Construction Recycled Content Ordinance (San Francisco Administrative Code, Section 6.4)	Ordinance requires the use of recycled content material in public works projects to the maximum extent feasible, and gives preference to local manufacturers and industry.	Project Complies	Construction contract specifications would be prepared in accordance with the requirements of Section 6.4 of the San Francisco Administrative Code. Construction of the proposed project would comply to the extent applicable.
Environment/Conservation Sector			
Street Tree Planting Requirements for New Construction (San Francisco Planning Code Section 138.1)	Planning Code Section 138.1 requires new construction, significant alterations, or relocations of buildings within many of San Francisco's zoning districts to plant a minimum of one tree of 24-inch box size for every 20 feet along the property street frontage.	Project Complies	Construction contract specifications would be prepared in accordance with the requirements of the San Francisco Planning Code Section 143. Construction of the proposed project would comply to the extent applicable. Future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's street tree planting requirements.
Green Building Requirements for City Buildings: Enhanced Refrigerant Management (San Francisco Environment Code, Chapter 7)	The LEED Project Administrator shall submit documentation verifying that the project will reduce ozone depletion, while minimizing direct contribution to climate change, achieving LEED credit EA 4.	Project Complies	The proposed project would be subject to and would comply with this regulation. The LEED Project Administrator will submit documentation demonstrating that ozone emissions from the proposed project would meet the requirements of Green Building for City Buildings: Enhanced Refrigerant Management.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
Green Building Requirements for City Buildings: Low-Emitting Materials (San Francisco Environment Code, Chapter 7)	The LEED Project Administrator shall submit documentation verifying that the project is using low-emitting materials, subject to on-site verification, achieving LEED credits EQ 4.1, EQ 4.2, EQ 4.3, and EQ 4.4 wherever applicable: (A) Adhesives, sealants, and sealant primers shall achieve LEED credit EQ 4.1, including compliance with South Coast Air Quality Management District (SCAQMD) Rule 1168. (B) Interior paints and coatings applied on-site shall achieve LEED credit EQ 4.2. including: (i) architectural paints and coatings shall meet the volatile organic compound (VOC) content limits of Green Seal Standard GS-11; (ii) anti-corrosive and anti-rust paints applied to interior ferrous metal substrates shall not exceed the VOC content limit of Green Seal Standard GC-03 of 250 grams per liter (g/L); (iii) clear wood finishes, floor coatings, stains, primers, and shellacs applied to interior elements shall not exceed SCAQMD Rule 1113 VOC content limits. (C) Flooring systems shall achieve LEED credit EQ 4.3 Option 1. including: (i) interior carpet shall meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus Program; (ii) interior carpet cushioning shall meet the requirements of the Carpet and Rug Institute Green Label Program; (iii) hard surface flooring, including linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring, and wall base shall be certified as compliant with the FloorScore Standard, provided, however, that 100% reused or 100% post-consumer recycled hard surface flooring may be exempted from this LEED credit EQ 4.3 requirement. Projects exercising this exemption for hard surface flooring shall otherwise be eligible for LEED credit EQ 4.3. (D) Interior composite wood and agrifiber products shall achieve LEED credit EQ 4.4 by containing no added urea formaldehyde resins. Interior and exterior hardwood plywood, particleboard, and medium-density fiberboard composite wood products	Project Complies	The proposed project would be subject to and would comply with this regulation. The LEED Project Administrator will submit documentation demonstrating that the proposed project would use low-emitting material in accordance with Green Building requirements for City Buildings: Low Emitting Materials.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
	shall additionally meet California Air Resources Board Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections. (E) Project sponsors are encouraged to achieve LEED Pilot Credit 2: Persistent Bioaccumulative Toxic Chemicals Source Reduction: Dioxins and Halogenated Organic Compounds. This standard is consistent with Environment Code Chapter 5: Non-PVC Plastics.		
Stormwater Management Ordinance and Construction Pollution Prevention (San Francisco Environment Code, Chapter 7)	For City-sponsored projects, the LEED Project Administrator shall submit documentation verifying that a construction project that is located outside the City and County of San Francisco achieves the LEED SS6.2 credit. Construction projects located within the City and County of San Francisco shall implement the applicable storm water management controls adopted by the SFPUC. All construction projects shall develop and implement construction activity pollution prevention and storm water management controls adopted by the SFPUC, and achieve LEED prerequisite SSp1 or similar criteria adopted by the SFPUC, as applicable.	Project Complies	The proposed project would be subject to and would comply with the Stormwater Management Ordinance and Construction Pollution Prevention.
Environmentally Preferable Purchasing Ordinance (formerly Precautionary Purchasing Ordinance)	Requires City departments to purchase products on the Approved Green Products List, maintained by the Department of the Environment. The items in the Approved Green Products List have been tested by San Francisco City Depts. and meet standards that are more rigorous than ecolabels in protecting our health and environment.	Project Complies	The proposed project would comply with the Environmentally Preferable Purchasing Ordinance to purchase products on the Approved Green Projects Lists.
Tropical Hardwood and Virgin Redwood Ban (Environment Code, Chapter 8)	The ordinance prohibits procuring or engaging in contracts that would use the ordinance-listed tropical hardwoods and virgin redwood.	Project Complies	The proposed project would comply with Tropical Hardwood and Virgin Redwood Ban to not to engage in contracts involving tropical hardwoods or virgin redwood.

Table 3.14-1
Proposed Project Consistency with San Francisco Climate Action Plan – Municipal Projects Checklist

Regulation	Requirement(s)	Project Compliance	Discussion
Wood Burning Fireplace Ordinance (San Francisco Building Code, Chapter 31, Section 3102.8)	Bans the installation of wood-burning fire places except for the following: • Pellet-fueled wood heater • EPA-approved wood heater • Wood heater approved by the Northern Sonoma Air Pollution Control District	Project Complies	The proposed project would not include wood-burning fireplaces, and future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's wood-burning fireplace ordinance.
Regulation of Diesel Backup Generators (San Francisco Health Code, Article 30)	Requires all diesel generators to be registered with the Department of Public Health. All new diesel generators must be equipped with the best available air emissions control technology.	Project Complies	The proposed project would comply with the Regulation of Diesel Backup Generators to register the emergency generators with the Department of Public Health. The generators would be equipped with the best available control technology.

Regulation	Requirements	Project Compliance	Discussion
Transportation Sector			
Commuter Benefits Ordinance (San Francisco Environment Code, Section 421)	All employers of 20 or more employees must provide at least one of the following benefit programs: (1) A Pre-Tax Election consistent with 26 USC Section 132(f), allowing employees to elect to exclude from taxable wages and compensation employee commuting costs incurred for transit passes or vanpool charges; or (2) Employer Paid Benefit whereby the employer supplies a transit pass for the public transit system requested by each Covered Employee or reimbursement for equivalent vanpool charges at least equal in value to the purchase price of the appropriate benefit; or (3) Employer Provided Transit furnished by the employer at no cost to the employee in a vanpool or bus, or similar multi-passenger vehicle operated by or for the employer.	Project Complies	Employees hired as a result of this project would be eligible for commuter benefits under the existing ordinance. Additionally, employees would not be charged to use the Muni system. The proposed project would not include any specific actions that would interfere with any existing policies or practices related to implementation of the Commuter Benefits Ordinance.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
Emergency Ride Home Program	All persons employed in San Francisco are eligible for the emergency ride home program.	Project Complies	Employees hired as a result of this project would be automatically eligible for the Emergency Ride Home Program. The proposed project would not include any specific actions that would interfere with any existing policies or practices related to the implementation of the Emergency Ride Home Program.
Transportation Management Programs (San Francisco Planning Code, Section 163)	Requires new buildings or additions over a specified size (buildings >25,000 square feet [sf] or 100,000 sf depending on the use and zoning district) within certain zoning districts (including downtown and mixed-use districts in the City's eastern neighborhoods and south of market) to implement a Transportation Management Program and provide on-site transportation management brokerage services for the life of the building.	Project Complies	Adjacent land development would include Transportation Management Programs. The proposed transit-orientated development is inherently consistent with this requirement.
Transit Impact Development Fee (San Francisco Planning Code, Section 411)	Establishes the following fees for all commercial developments. Fees are paid to the Department of Building Inspection and provided to San Francisco MTA to improve local transit services. Review Planning Code Section 411.3(a) for applicability.	Project Complies	The project would comply with the San Francisco Planning Code, as applicable.
Jobs-Housing Linkage Program (San Francisco Planning Code Section 413)	The Jobs-Housing Program found that new large-scale developments attract new employees to the City who require housing. The program is designed to provide housing for those new uses within San Francisco, thereby allowing employees to live close to their place of employment. The program requires a developer to pay a fee or contribute land suitable for housing to a housing developer or pay an in-lieu fee.	Not Applicable	Not applicable.
Bicycle Parking in New and Renovated Commercial Buildings (San Francisco Planning Code, Section 155.4)	Professional Services: (A) Where the gross square footage of the floor area is between 10,000 and 20,000 sf, three bicycle spaces are required. (B) Where the gross square footage of the floor area is between 20,000 and 50,000 sf, six bicycle spaces are required. (C) Where the gross square footage of the floor area exceeds 50,000 sf, 12 bicycle spaces are required. Retail Services: (A) Where the gross square footage of the floor area is	Project Complies	The future land development for the proposed project would be subject to this regulation. Therefore, the future land development would be conditioned to comply with the applicable regulations.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
	between 25,000 and 50,000 sf, three bicycle spaces are required. (B) Where the gross square footage of the floor area is between 50,000 and 100,000 sf, six bicycle spaces are required. (C) Where the gross square footage of the floor area exceeds 100,000 sf, 12 bicycle spaces are required.		
Bicycle Parking in Parking Garages (San Francisco Planning Code, Section 155.2)	Garages with more than 500 automobile spaces shall provide 25 spaces plus one additional space for every 40 automobile spaces over 500 spaces, up to a maximum of 50 bicycle parking spaces.	Project Complies	The future land development for the proposed project would be subject to this regulation. Therefore, the future development would be conditioned to comply with the applicable regulations.
Bicycle Parking in Residential Buildings (San Francisco Planning Code, Section 155.5)	(A) For projects up to 50 dwelling units, one Class 1 space for every two dwelling units. (B) For projects over 50 dwelling units, 25 Class 1 spaces plus one Class 1 space for every four dwelling units over 50.	Project Complies	The future land development for the proposed project would be subject to this regulation. Therefore, the future development would be conditioned to comply with the applicable regulations.
San Francisco Green Building Requirements (San Francisco Building Code, Chapter 13C.106.5 and 13C.5.106.5)	Requires new Large Commercial projects, new High-Rise Residential projects, and Commercial Interior projects to provide designated parking for low-emitting, fuel-efficient, and carpool/van pool vehicles. Mark 8% of parking stalls for such vehicles.	Project Complies	The land development associated with the proposed project would be conditioned to comply with the City's Building Code, Chapter 13C, 106.5, and 13.5, 106.5. 106.5) and to provide designated parking for low-emitting, fuel-efficient, and carpool/van pool vehicles.
Car Sharing Requirements (San Francisco Planning Code, Section 166)	New residential projects or renovation of buildings being converted to residential uses within most of the City's mixed-use and transit-oriented residential districts are required to provide car share parking spaces.	Project Complies	Future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's Planning Code Section 166 and to provide car share parking spaces.
Parking Requirements for San Francisco's Mixed-Use Zoning Districts (San Francisco Planning Code Section 151.1)	The Planning Code has established parking maximums for many of San Francisco's mixed-use districts.	Project Complies	The proposed project would be subject to and would comply with this regulation.
Energy Efficiency Sector			
San Francisco Green Building Requirements for Energy Efficiency (San Francisco Building Code, Chapter 13C.5.201.1.1)	New construction of non-residential buildings requires the demonstration of a 15% energy reduction compared to 2008 California Energy Code, Title 24, Part 6.	Project Complies	The proposed project would comply with the City's requirements for New Non-Residential Energy Efficient Buildings and would demonstrate a minimum of 15% energy reduction compared to the California Energy Code, Title 24, Part 6.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
San Francisco Green Building Requirements for Energy Efficiency (LEED EA3, San Francisco Building Code, Chapter 13C.5.410.2)	For new Large Commercial Buildings, requires enhanced commissioning of building energy systems. For new large buildings greater than 10,000 sf, commissioning shall be included in the design and construction to verify that the components meet the owner's or owner representative's project requirements.	Project Complies	The proposed project is subject to and would comply with this regulation.
Commissioning of Building Energy Systems (LEED prerequisite, EAp1)	Requires fundamental commissioning for new high-rise residential, commercial interior, commercial, and residential alteration projects.	Project Complies	The proposed project is subject to and would comply with this regulation.
San Francisco Green Building Requirements for Energy Efficiency (San Francisco Building Code, Chapter 13C)	Commercial buildings greater than 5,000 sf will be required to be a minimum of 14% more energy efficient than Title 24 energy efficiency requirements. As of 2008, large commercial buildings are required to have their energy systems commissioned, and as of 2010, these large buildings are required to provide enhanced commissioning in compliance with LEED Energy and Atmosphere Credit 3. Mid-sized commercial buildings are required to have their systems commissioned by 2009, with enhanced commissioning by 2011.	Project Complies	The future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's Green Building Requirements for Energy Efficiency (Building Code Chapter 13C) and to achieve a minimum of 14% more energy efficiency than Title 24 energy efficiency requirements. The proposed project would provide enhanced commissioning in compliance with LEED Energy and Atmosphere Credit 3.
San Francisco Green Building Requirements for Energy Efficiency (San Francisco Building Code, Chapter 13C)	Under the Green Point Rated system and in compliance with the Green Building Ordinance, all new residential buildings will be required to be at a minimum 15% more energy efficient than Title 24 energy efficiency requirements.	Project Complies	The residential units would be conditioned to achieve minimum 15% more energy efficiency than Title 24 energy efficiency requirements.
San Francisco Green Building Requirements for Stormwater Management (San Francisco Building Code, Chapter 13C) *or* San Francisco Stormwater Management Ordinance (Public Works Code Article 4.2)	Requires all new development or redevelopment disturbing more than 5,000 sf of ground surface to manage storm water on-site using low-impact design. Projects subject to the Green Building Ordinance Requirements must comply with either LEED Sustainable Sites Credits 6.1 and 6.2, or with the City's Stormwater Management Ordinance and Stormwater Design Guidelines.	Project Complies	The land development for the proposed project would include management of on-site storm water and would comply with either LEED Sustainable Sites Credits 6.1 or with the City's Stormwater Management Ordinance and Stormwater Design Guidelines.
San Francisco Green Building Requirements for Water Efficient Landscaping (San Francisco Building Code, Chapter 13C)	All new commercial buildings greater than 5,000 sf are required to reduce the amount of potable water used for landscaping by 50%.	Project Complies	The future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's Green Building

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
			Requirements for water efficient landscaping, and to reduce the amount of potable water used for landscaping by 50%.
San Francisco Green Building Requirements for Water Use Reduction (San Francisco Building Code, Chapter 13C)	All new commercial buildings greater than 5,000 sf are required to reduce the amount of potable water used by 20%.	Project Complies	The future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's Green Building Requirements for water use and to reduce the amount of potable water used by 20%.
Indoor Water Efficiency (San Francisco Building Code, Chapter 13C sections 13C.5.103.1.2, 13C.4.103.2.2, and 13C.303.2)	If meeting a LEED standard: • Reduce overall use of potable water within the building by a specified percentage – for showerheads, lavatories, kitchen faucets, wash fountains, water closets, and urinals. • New large commercial and new high-rise residential buildings must achieve a 30% reduction. • Commercial interior, commercial alternation, and residential alteration should achieve a 20% reduction below UPC/IPC 2006 et al. If meeting a GreenPoint Rated Standard: • Reduce overall use of potable water within the building by 20% for showerheads, lavatories, kitchen faucets, wash fountains, water closets, and urinals.	Project Complies	The commercial and residential future land developments adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility will be conditioned to comply with the City's Building Code for Indoor Water Efficiency.
San Francisco Water Efficient Irrigation Ordinance	Projects that include 1,000 sf or more of new or modified landscape are subject to this ordinance, which requires that landscape projects be installed, constructed, operated, and maintained in accordance with rules adopted by the SFPUC that establish a water budget for outdoor water consumption. Tier 1: 1,000 sf <= project landscape <2,500 sf Tier 2: Project landscape area is greater than or equal to 2,500 sf. Note, Tier 2 compliance requires the services of landscape professionals. See the SFPUC website for information regarding exemptions to this requirement (www.sfwater.org/landscape).	Project Complies	The proposed project would be constructed, operated, and maintained in accordance with the rules and regulations adopted by the SFPUC and would comply with the City's Water Efficient Irrigation Ordinance.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
Commercial Water Conservation Ordinance (San Francisco Building Code, Chapter 13A)	Requires all existing commercial properties undergoing tenant improvements to achieve the following minimum standards: 1. All showerheads have a maximum flow of 2.5 gallons per minute (gpm) 2. All showers have no more than one showerhead per valve 3. All faucets and faucet aerators have a maximum flow rate of 2.2 gpm 4. All water closets (toilets) have a maximum rated water consumption of 1.6 gallons per flush (gpf) 5. All urinals have a maximum flow rate of 1.0 gpf 6. All water leaks have been repaired.	Not Applicable	Not applicable.
Residential Water Conservation Ordinance (San Francisco Building Code, Housing Code, Chapter 12A)	Requires all residential properties (existing and new), prior to sale, to upgrade to the following minimum standards: 1. All showerheads have a maximum flow of 2.5 gpm 2. All showers have no more than one showerhead per valve 3. All faucets and faucet aerators have a maximum flow rate of 2.2 gpm 4. All water closets (toilets) have a maximum rated water consumption of 1.6 gallons per flush (gpf) 5. All urinals have a maximum flow rate of 1.0 gpf 6. All water leaks have been repaired. Although these requirements apply to existing buildings, compliance must be completed through the Department of Building Inspection, for which a discretionary permit (subject to CEQA) would be issued.	Project Complies	The future residential land development would be conditioned to comply with the requirements of the Residential Water Conservation Ordinance; the compliance would be completed through the Department of Building Inspection.
Residential Energy Conservation Ordinance (San Francisco Building Code, San Francisco Housing Code, Chapter 12)	Requires all residential properties to provide, prior to sale of property, certain energy and water conservation measures for their buildings: attic insulation; weather-stripping all doors leading from heated to unheated areas; insulating hot water heaters and insulating hot water pipes; installing low-flow showerheads; caulking and sealing any openings or cracks in the building's exterior; insulating accessible heating and cooling ducts; installing low-flow water-tap aerators; and installing or retrofitting toilets to make them low-flush. Apartment buildings and hotels are also required to insulate steam and hot water	Not Applicable	Not applicable.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
	pipes and tanks, clean and tune their boilers, repair boiler leaks, and install a time-clock on the burner. Although these requirements apply to existing buildings, compliance must be completed through the Department of Building Inspection, for which a discretionary permit (subject to CEQA) would be issued.		
Renewable Energy Sector			
San Francisco Green Building Requirements for Renewable Energy (San Francisco Building Code, Chapter 13C)	As of 2012, all new large commercial buildings are required to either generate 1% of energy on-site with renewables, or purchase renewable energy credits pursuant to LEED Energy and Atmosphere Credits 2 or 6, or achieve an additional 10% beyond Title 24 2008. Credit 2 requires providing at least 2.5% of the buildings energy use from on-site renewable sources. Credit 6 requires providing at least 35% of the building's electricity from renewable energy contracts.	Project Complies	The commercial land use development for the proposed project would be conditioned to comply with the City's Green Building Requirements for Renewable Energy in either producing 1% of the energy on-site or purchasing renewable energy credits, or achieve an additional 10% beyond Title 24 2008.
Waste Reduction Sector			
Mandatory Recycling and Composting Ordinance (San Francisco Environment Code, Chapter 19) and San Francisco Green Building Requirements for Solid Waste (San Francisco Building Code, Chapter 13C)	All persons in San Francisco are required to separate their refuse into recyclables, compostables, and trash, and place each type of refuse in a separate container designated for disposal of that type of refuse. Pursuant to Section 1304C.0.4 of the Green Building Ordinance, all new construction, renovation, and alterations subject to the ordinance are required to provide recycling, composting, and trash storage, collection, and loading that is convenient for all users of the building.	Project Complies	The proposed project would be subject to and would comply with this regulation.
San Francisco Green Building Requirements for Construction and Demolition Debris Recycling (San Francisco Building Code, Chapter 13C)	Projects proposing demolition are required to divert at least 75% of the project's construction and demolition debris to recycling.	Project Complies	Construction contract specifications for the proposed project components would include the requirement that the contractor prepare a Construction and Demolition Debris Management Plan to recycle demolition or other construction waste to the maximum extent possible, with a goal of 75% diversion.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
San Francisco Construction and Demolition Debris Recovery Ordinance (San Francisco Environment Code, Chapter 14)	Requires that a person conducting full demolition of an existing structure to submit a waste diversion plan to the Director of the Environment that provides for a minimum of 65% diversion from landfill of construction and demolition debris, including materials source separated for reuse or recycling.	Project Complies	The construction contract specifications would require the contractor to prepare and submit a waste diversion plan to the Director of the Environment and comply with the requirements of the City's Construction and Demolition Debris Recovery Ordinance.
Environment/Conservation Sector			
Street Tree Planting Requirements for New Construction (San Francisco Planning Code Section 138.1)	Planning Code Section 138.1 requires new construction, significant alterations, or relocation of buildings within many of San Francisco's zoning districts to plant one 24-inch box size tree for every 20 feet along the property street frontage.	Project Complies	The proposed project would be subject to and would comply with this regulation.
Light Pollution Reduction (San Francisco Building Code, Chapter 13C5.106.8)	For nonresidential projects, comply with lighting power requirements in California Energy Code, CCR Part 6. Requires that lighting be contained within each source. No more than 0.01 horizontal lumen foot candles 15 feet beyond site, or meet LEED credit SSc8.	Project Complies	The nonresidential land use development for the proposed project would be subject to and would comply with the City's Building Code – Light Pollution Reduction.
Construction Site Runoff Pollution Prevention for New Construction (San Francisco Building Code, Chapter 13C)	Construction site runoff pollution prevention requirements depend on project size, occupancy, and the location in areas served by combined or separate sewer systems. Projects meeting a LEED standard must prepare an erosion and sediment control plan (LEED prerequisite SSP1). Other local requirements may apply regardless of whether or not LEED is applied, such as a storm water soil loss prevention plan or a Storm Water Pollution Prevention Plan (SWPPP). See the SFPUC website for more information (www.sfwater.org/CleanWater).	Project Complies	The proposed project would be subject to and would comply with this regulation.
Enhanced Refrigerant Management (San Francisco Building Code, Chapter 13C.5.508.1.2)	All new large commercial buildings must not install equipment that contains chlorofluorocarbons (CFCs) or halons.	Project Complies	The proposed project would be subject to and would comply with this regulation.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
Low-Emitting Adhesives, Sealants, and Caulks (San Francisco Building Code, Chapters 13C.5.103.1.9, 13C.5.103.4.2, 13C.5.103.3.2, 13C.5.103.2.2, 13C.504.2.1)	If meeting a LEED standard: • Adhesives and sealants (VOCs) must meet SCAQMD Rule 1168 and aerosol adhesives must meet Green Seal standard GS-36 (not applicable for new high-rise residential). If meeting a GreenPoint Rated Standard: • Adhesives and sealants (VOCs) must meet SCAQMD Rule 1168.	Project Complies	The proposed project would be subject to and would comply with this regulation.
Low-Emitting Materials (San Francisco Building Code, Chapters 13C.4. 103.2.2)	For small and medium-sized residential buildings: • Effective January 1, 2011, meet GreenPoint Rated designation with a minimum of 75 points. For new high-rise residential buildings: • Effective January 1, 2011, meet LEED Silver Rating or GreenPoint Rated designation with a minimum of 75 points. For alterations to residential buildings: • Submit documentation regarding the use of low-emitting materials. If meeting a LEED standard: • For adhesives and sealants (LEED credit EQ4.1), paints and coatings (LEED credit EQ4.2), and carpet systems (LEED credit EQ4.3), where applicable. If meeting a GreenPoint Rated Standard: • Meet the GreenPoint Rated Multifamily New Home Measures for low-emitting adhesives and sealants, paints and coatings, and carpet systems.	Project Complies	The future residential land development would be conditioned to comply with the City's Building Code requirements for low-emitting materials.
Low-Emitting Paints and Coatings (San Francisco Building Code, Chapters 13C.5.103.1.9, 13C.5.103.4.2, 13C.5.103.3.2, 13C.5.103.2.2, 13C.504.2.2 through 2.4)	If meeting a LEED Standard: Architectural paints and coatings must meet Green Seal Standard GS-11, anti-corrosive paints meet GC-03, and other coatings meet SCAQMD Rule 1113. (Not applicable for New High Rise residential.) If meeting a GreenPoint Rated Standard: • Interior wall and ceiling paints must meet <50 grams per liter VOCs regardless of sheen. VOC Coatings must meet SCAQMD Rule 1113.	Project Complies	The proposed project would be subject to and would comply with this regulation.

Table 3.14-2
Proposed Project Consistency with San Francisco Climate Action Plan – Private Development Projects Checklist

Regulation	Requirements	Project Compliance	Discussion
Low-Emitting Flooring, Including Carpet (San Francisco Building Code, Chapters 13C.5.103.1.9, 13C.5.103.4.2, 13C.5.103.3.2, 13C.5.103.2.2, 13C.504.3, and 13C.4.504.4)	If meeting a LEED Standard: • Hard surface flooring (vinyl, linoleum, laminate, wood, ceramic, and/or rubber) must be Resilient Floor Covering Institute FloorScore certified; carpet must meet the Carpet and Rug Institute (CRI) Green Label Plus; Carpet cushion must meet CRI Green Label; carpet adhesive must meet LEED EQc4.1. (Not applicable for New High Rise Residential.) If meeting a GreenPoint Rated Standard: • All carpet systems, carpet cushions, carpet adhesives, and at least 50% of resilient flooring must be low-emitting.	Project Complies	The proposed project would be subject to and would comply with this regulation.
Low-Emitting Composite Wood (San Francisco Building Code, Chapters 13C.5.103.1.9, 13C.5.103.4.2, 13C.5.103.3.2, 13C.5.103.2.2 and 13C.4.504.5)	If meeting a LEED Standard: • Composite wood and agrifiber must not contain added urea-formaldehyde resins and must meet applicable CARB Air Toxics Control Measure. If meeting a GreenPoint Rated Standard: • Must meet applicable CARB Air Toxics Control Measure formaldehyde limits for composite wood.	Project Complies	The proposed project would be subject to and would comply with this regulation.
Wood Burning Fireplace Ordinance (San Francisco Building Code, Chapter 31, Section 3102.8)	Bans the installation of wood burning fire places except for the following: Pellet-fueled wood heater, EPA-approved wood heater, or wood heater approved by the Northern Sonoma Air Pollution Control District.	Project Complies	The proposed project does not include wood burning fireplaces, and future land development adjacent to the vent structures at Second and Harrison Streets and at 701 Third Street and above the intercity bus facility would be conditioned to comply with the City's wood-burning fireplace ordinance.
Regulation of Diesel Backup Generators (San Francisco Health Code, Article 30)	Requires (among other things): all diesel generators to be registered with the Department of Public Health; all new diesel generators must be equipped with the best available air emissions control technology.	Project Complies	The proposed project would comply with Regulation of Diesel Backup Generators to register the emergency generators with the Department of Public Health. The generators would be equipped with the best available control technology.

Impact CU-CC-2: The proposed project would be consistent with applicable plans adopted to reduce GHG emissions. (No Adverse Effect/Less-than-Significant Impact)

Local and regional plans adopted to reduce GHG emissions include San Francisco's Strategies to Address Greenhouse Gas Emissions and the RTP/SCS. Tables 3.14-1 and 3.14-2, below, and the discussion of Impact CU-CC-1 demonstrate how the proposed project would comply with San Francisco's Strategies to Address Greenhouse Gas Emissions.

Plan Bay Area is an integrated long-range transportation and land-use/housing plan that supports a growing economy, provides more housing and transportation choices, and reduces transportation-related pollution in the San Francisco Bay Area. Performance targets identified in Plan Bay Area and applicable to the proposed project include reducing per-capita GHG emissions from cars and light-duty trucks and decreasing per-capita automobile VMT. The proposed project would not alter the operating plans for Caltrain or HSR, and would enable HSR service to the Transit Center by complying with California High-Speed Rail Authority design specifications. Accordingly, the proposed project would enable regional vehicle miles traveled reductions and associated beneficial reduction in GHG emissions. As discussed above, other transportation improvements would result in negligible GHG emissions. Importantly, the bicycle/controlled vehicle ramp and underground pedestrian connector would contribute to the Plan Bay Area goal of a walkable and bike-able urban environment. In addition, the adjacent land use developments would locate mixed-use commercial and residential uses adjacent to mass transit and other amenities. As a whole, the proposed project would contribute to providing a range of transportation choices and transit-oriented land uses in the downtown San Francisco area, as encouraged by Plan Bay Area to reduce GHG emissions from cars and per-capita VMT. The proposed project, therefore, would be consistent with and further the goals and strategies of the City's CAP and Plan Bay Area.

3.14.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Greenhouse Gases and Climate Change (Beneficial)	Although the 2004 FEIS/EIR acknowledged regional air quality benefits, analysis of GHG and climate change effects were not required for NEPA documents prepared at that time. The 2010 FRA Reevaluation reported GHG benefits of designing the train box to allow use by HSR trains. The proposed project analyzed in this SEIS/EIR would result in an additional beneficial effect compared to the 2004 FEIS/EIR. While no NEPA effect summary is required, the proposed project would support and enable reductions in GHG emissions, which would be beneficial and contribute to efforts to moderate climate change effects.
CEQA Summary	
Impact CU-CC-1: GHG Emissions (Beneficial)	Although the 2004 FEIS/EIR acknowledged regional air quality benefits, analysis of GHG and climate change effects were not required for CEQA documents prepared at that time. Since the 2004 FEIS/EIR, guidelines and regulations have been put into place calling for consideration of GHG emissions. The proposed project analyzed in this SEIS/EIR would result in a new beneficial impact not identified in the 2004 FEIS/EIR related to GHG emissions reductions and climate change. No mitigation measures would be required for the proposed project.
Impact CU-CC-2: Consistency with Applicable Plans Adopted to Reduce GHG Emissions (Less than Significant)	Although the 2004 FEIS/EIR acknowledged regional air quality benefits, analysis of GHG and climate change effects were not required for CEQA documents prepared at that time, and neither the City CAP nor Plan Bay Area had been adopted. The proposed project analyzed in this SEIS/EIR was analyzed to determine whether it would result in a new impact not identified in the 2004 FEIS/EIR related to consistency with applicable plans and policies. The proposed project would be consistent with applicable plans adopted to reduce GHG emissions. No mitigation measures would be required for the proposed project.

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3.15 PUBLIC SERVICES, COMMUNITY SERVICES, AND RECREATIONAL FACILITIES

3.15.1 Introduction

This section describes the existing parklands, community services, and recreational facilities in the proposed project area. The analysis examines the potential impacts that may result from implementation of the proposed project, including the removal of or disruption to recreational facilities and activities, emergency services, and/or other public services available to the community. This analysis focuses on the proposed project component locations and whether they would significantly or adversely affect public facilities or community facilities, and/or whether conditions have changed since approval of the 2004 FEIS/EIR (FTA 2004). Additional information regarding safety and security services in the proposed project area and the proposed project's effects on these services is provided in Section 3.16, Safety and Security, of this SEIS/EIR. For federally-funded transportation projects, Section 4(f) of the Department of Transportation Act of 1966 requires, among other things, consideration of potential effects of a federal action on public parks, recreation areas, wildlife and waterfowl refuges, and public and private historic sites. The Section 4(f) analysis is included in Chapter 6, Section 4(f) Evaluation, of this SEIS/EIR.

3.15.2 Affected Environment

The proposed project study area encompasses the geographic area potentially most affected by the proposed project. Although analysis of physical effects is generally limited to the immediate disturbed area, this analysis also considers the surrounding neighborhoods (within approximately 0.25 miles) that make use of any local parklands, public facilities, or community services that may be affected by the proposed project.

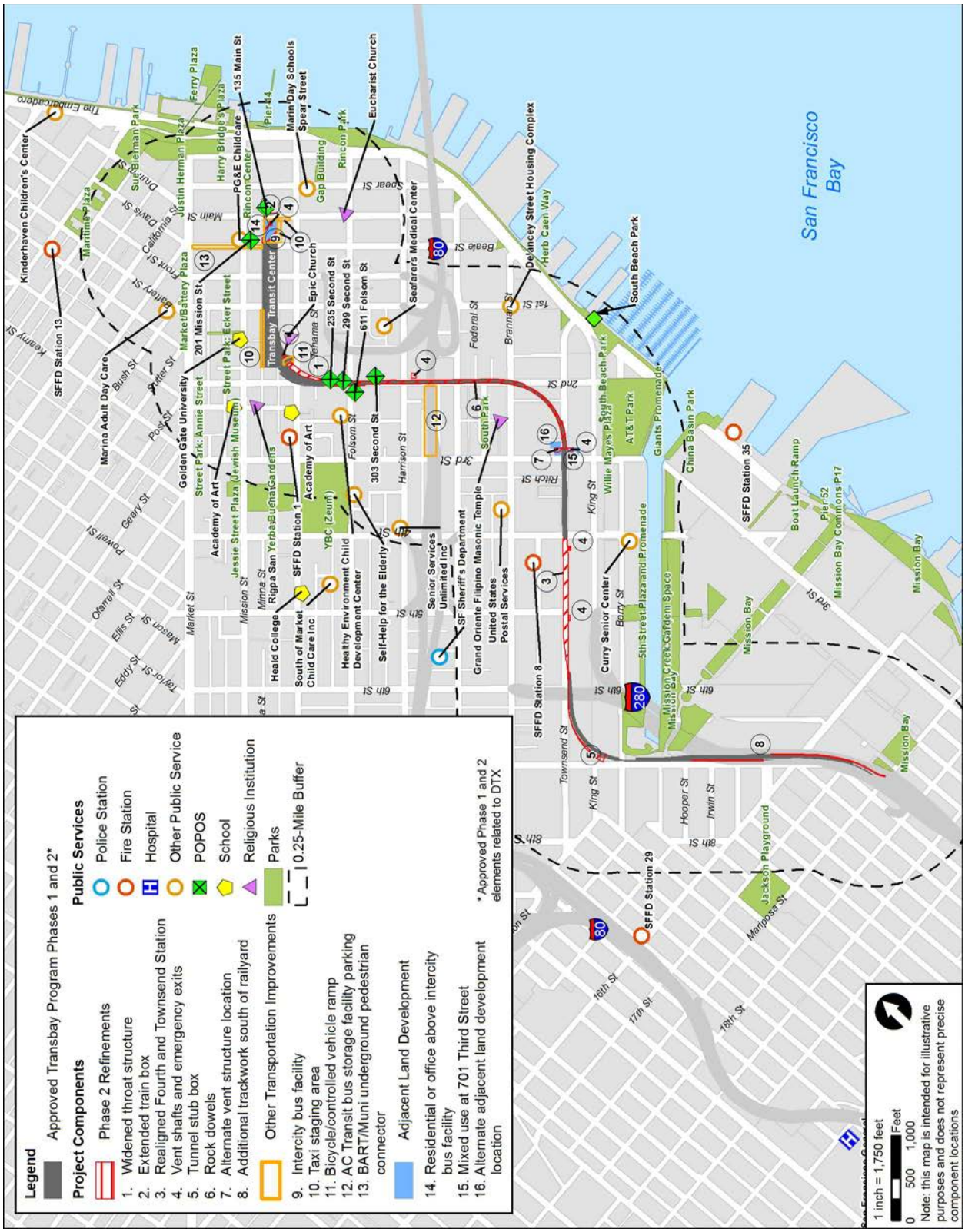
The proposed project would be located in an area that is in the process of becoming a new high-density mixed-use neighborhood dominated by retail, mixed uses, office space, and residential uses. Hence, the area will support an increasingly dense local population that will require public services such as police, fire, and emergency assistance. In addition, public facilities such as parklands, schools, religious institutions, and community services contribute to the health and welfare of the communities in and near the proposed project area. Detailed descriptions of local services and public facilities within the study area are described in the sections that follow. Figure 3.15-1 shows the locations of these local resources.

Law Enforcement Services

San Francisco Police Department

The San Francisco Police Department (SFPD) provides law enforcement services in the City. Daily patrols (both auto and foot) are performed by police officers of the Field Operations Bureau from 10 district stations. In 2012, approximately 44,884 Part 1 criminal incidents were documented in the City; approximately 13 percent of these were violent crimes such as homicides, burglaries, and assaults (SFPD 2013). The SFPD employs a staff of 1,971 (SFPD 2013). Because of the large number of retirements occurring in recent years, the SFPD developed a 6-year hiring plan to gradually increase the number of new officers on the force by approximately 150 new recruits per year. The SFPD does not have an adopted standard for the ratio of officers to population or to the number of service calls and crime incidents. Instead, the San Francisco City Charter, Section 4.127, mandates a minimum City police staffing level of 1,971 sworn officers (PERF 2008).

The SFPD's Southern Station at 850 Bryant Street is the closest police station to the study area. The Southern District is bound by the Bay on the east; China Basin Channel on the south; Market Street on the north; and Duboce, Thirteenth, and Division Streets on the west. The district also includes the area bounded by Vermont, Sixteenth, and DeHaro Streets. The station is located 0.4 mile west of the Fourth



Sources: City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.15-1 Community Facilities and Public Services

and King Street Caltrain Station and approximately 1.2 miles southwest of the Transit Center. The next closest station is in the Tenderloin District at 301 Eddy Street (approximately 0.85 mile away). Immediately to the north and west is the Central District area, supported by the Central Station at 766 Vallejo Street near Powell Street (approximately 1 mile away).

In 2007, the Southern District received an average of 2,688 calls for service per week, which are dispatched from the City's Emergency Communication Division. The Central District and Tenderloin District average 1,401 and 1,331 calls for service per week, respectively (PERF 2008).

In the performance measures for the SFPD set out as part of the City's 2008/2009 budget plan, the SFPD established target response times: 4.4 minutes for Priority A calls, 8.3 minutes for Priority B calls, and 10.8 minutes for Priority C calls. Table 3.15-1 shows the most current information available regarding average response times per district, measured from the time the call was dispatched until the unit arrived. In 2007, the SFPD met the 2008/2009 target response times for Priority A and C calls, but failed to meet the Priority B target response time of 8.3 minutes. The Southern Station failed to meet the target response times for any of the Priority A, B, and C targets, and the Tenderloin Station met all three targets. Central Station met the Priority A target response time of 4.4 minutes, but failed to meet the Priority B or C targets (PERF 2008).

Table 3.15-1
Average District Response Time (2007), in Minutes

District	Priority A Calls	Priority B Calls	Priority C Calls
Southern	4.8	15.7	15.5
Central	3.8	11.6	11.5
Tenderloin	1.8	5.2	5.7
Total Average of SFPD's 10 District Stations	3.43	9.8	10.68

Note:
SFPD = San Francisco Police Department
Source: Compiled from San Francisco Department of Emergency Management Computer-Aided Dispatch Data 2007

In 2012, approximately 8,696 incidents were reported in the Southern District, which is approximately 19 percent of the citywide total of Part 1 criminal incidents, which include violent crimes such as homicides, burglaries, and assaults (SFPD 2013).

Other Law Enforcement Agencies

The San Francisco Sheriff's Department (SFSD) at 70 Oak Grove Street manages the six San Francisco County jails, makes arrests on warrants, transports fugitives, and provides security to the civil and criminal courts and City Hall. In addition, the SFSD augments law enforcement at the request of the SFPD. The SFSD works with the SFPD and State Department of Corrections when arresting state parolees, and works with the SFPD during natural disasters and civic emergencies.

In addition to the local police force, the California Highway Patrol at 455 Eighth Street has legal jurisdiction over the Transit Center and provides law enforcement officers to patrol the interior and the sidewalks surrounding the structure. Other security and enforcement agencies with jurisdiction in or near the study area are Amtrak, whose security officers police Caltrain vehicles and patrol Caltrain stations and parking areas, and BART police who patrol the Embarcadero and Montgomery BART stations within the study area. AC Transit and Golden Gate Transit also have security personnel who monitor their facilities.

Fire Protection and Emergency Services

The San Francisco Fire Department (SFFD) provides fire suppression and prevention services and first-response to medical emergencies. The SFFD consists of 43 engine companies, 19 truck companies, a dynamically deployed fleet of ambulances, two heavy-rescue squad units, two fireboats, and multiple special-purpose units (SFFD 2014a). Two fire stations are in the study area. Station 1 at 935 Folsom Street has 13 personnel and is equipped with one engine (pumper), one (ladder) truck, one heavy-rescue squad, and one ambulance. Station 8 at 36 Bluxome Street has 10 personnel, including a Battalion Chief without a vehicle, and is equipped with one engine and one truck (SFFD 2014b). Five other stations are located nearby: Station 2 at 1340 Powell Street, Station 13 at 530 Sansome Street, Station 29 at 299 Vermont Street, and Station 35/Fireboats at Pier 22½. Station 36 at 109 Oak Street is currently closed for renovation and its services have been relocated to Station 6 (SFFD 2014c).

Fire stations are strategically located to allow personnel to reach emergencies in the surrounding area quickly. 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. The state's target response time goal for Code 3 calls (i.e., life-threatening fire and medical emergencies) is 5 minutes. Code 3 calls are the highest-response priority (City and County of San Francisco 2004).

San Francisco's objective is to respond to high-priority medical emergencies (i.e., Code 3 calls) within 6.5 minutes of receiving a 911 call, 90 percent of the time. The 6.5-minute goal includes 2 minutes for dispatch and 4.5 minutes for the fire engine or ambulance to arrive at the curb. This standard was adopted in 2004 by the San Francisco Emergency Medical Services Agency under the Department of Public Health. A 2004 report by the San Francisco Fire Commission noted that the response time for Emergency Medical Care (called Advanced Life Support by the SFFD) is 4 minutes 40 seconds, which indicates that the SFFD is meeting both the City and state standards (SFFD 2004).

The SFFD uses both the low-pressure hydrant system and the high-pressure hydrant Auxiliary Water Supply System (AWSS) for firefighting within the Transbay Redevelopment Project Area and the Caltrain railyard. The AWSS provides an independent secondary source of water exclusively for firefighting and is just inland of The Embarcadero. Covering the entire study area and vicinity, the AWSS system also includes two additional back-up emergency water supplies: a portable water supply system that can duplicate the underground high-pressure system above ground, and a system of underground cisterns (SFFD 2013). Five underground cisterns are in the study area, with a total of 334,000 gallons of water storage capacity: one at Howard and Beale Streets, one at Howard and First Streets, one at Folsom and First Streets, one at Second and Folsom Streets, and one at First and Harrison Streets. The water mains that serve the area are in satisfactory condition, and both the water supply and pressure are considered adequate for firefighting purposes. To repair and upgrade San Francisco's firefighting water system, citizens approved the Earthquake Safety and Emergency Response Bond in 2010 (Earthquake Safety and Emergency Response Board 2010).

Incidents involving known hazardous materials are handled by the SFFD's Hazardous Materials Unit (Haz-Mat Support Unit 1), which is made up of members from Engine Company 36, located at 109 Oak Street, and backed by Rescue Unit and Battalion 2 members. The San Francisco Fire Code (as well as the San Francisco Health Code) establishes a system for permitting and monitoring the use and disposal of hazardous materials.

Emergency medical services in San Francisco are provided by SFFD ambulances, which are complemented by SFFD Rescue Units and engines and trucks with "first response" capability. Ambulance Zone 1, the busiest of all eight San Francisco zones, spans the study area, which represents

nearly one-fourth of the zone. Zone 1 extends from Van Ness Avenue on the west, Townsend Street on the south, and The Embarcadero on the northeast.

Emergency Medical Services

Emergency medical transportation to San Francisco hospitals is provided by a fleet of public and private ambulance services. The SFFD also provides emergency medical services and transport in the proposed project area.

The closest hospital is Saint Francis Memorial Hospital at 900 Hyde Street (approximately 1 mile away). Saint Francis Hospital treats more than 1 million people every year. Saint Francis Hospital is a fully accredited community-based hospital with 359 licensed beds (SFMH 2014). San Francisco General Hospital, located at 1001 Potrero Avenue (approximately 1.1 miles away), is the main public hospital in San Francisco and the only Level 1 Trauma Center for San Francisco and northern San Mateo County (SFDPH 2014).

Emergency vehicle access in the proposed project area is available to all buildings by the existing roadway network. Although obstacles such as high traffic during peak commute hours and small-turning-radius and maneuverability issues exist, emergency vehicles can still access these buildings.

Disaster Preparedness

The San Francisco Department of Emergency Management plans and coordinates emergency services in the event of a natural disaster. The City's Disaster Preparedness Plan divides the City into 10 districts. The Transit Center and the Transbay Redevelopment Project Area are in District Three: South of Market Southern Waterfront. The designated fire station in the area is Station 8 at 38 Bluxome Street. The designated first aid shelter is the South of Market Health Center located at 551 Minna Street. A staging area for the district has yet to be designated (San Francisco Department of Emergency Management 2010, 2014).

Section 3.16, Safety and Security, of this SEIS/EIR discusses the potential for accidents, such as train derailment and collisions; personal safety on transit vehicles, at stations, and at parking lots; and potential risks from terrorists.

Public and Community Facilities

The U.S. Postal Service maintains a facility in the study area: a local post office at 460 Brannan Street. A former postal facility located at 390 Main Street will become (in late 2015) the shared headquarters for regional public agencies such as the Metropolitan Transportation Commission, Bay Area Toll Authority, Association of Bay Area Governments, Bay Area Air Quality Management District, and Bay Conservation and Development Commission.

Medical/social welfare facilities within the proposed project study area include the Seafarers Medical Center, a non-profit clinic at 40 Lansing Street, and the Delancey Street housing complex at Delancey and Brannan Streets on The Embarcadero. Operated by the non-profit Delancey Street Foundation, this four-story complex serves individuals recovering from alcohol- and drug-related or other social problems, and includes offices of the foundation's moving and transportation company and a restaurant (Delancey Street Foundation 2014).

Four service centers for older adults are located within the proposed project study area: Marina Adult Day Care at 100 Bush Street (approximately 0.20 mile away), Self-Help for the Elderly and the Mendelsohn

House Activity Center at 737 Folsom Street (approximately 0.22 mile away), Senior Services Unlimited Incorporated at 788 Harrison Street (approximately 0.30 mile away), and Curry Senior Center at 930 Fourth Street (approximately 0.13 mile away).

Five child-care centers are located within the proposed project study area: Marin Day Schools Spear Street at 220 Spear Street, Healthy Environmental Child Development Center at 95 Hawthorne Street, Kinderhaven Children's Center at 474 The Embarcadero, South of Market Child Care Inc. at 366 Clementina Street, services in the PG&E building at Mission and Beale Streets, and University Child Care at UCSF Mission Bay, 1555 Sixth Street. See Section 3.4, Socioeconomics, Population, and Housing, of this SEIS/EIR for additional discussion of impacts of the proposed project on children.

Parks and Recreational Facilities

The San Francisco Recreation and Parks Department owns and manages more than 3,300 acres of open space in the City. The combined City, state, and federal property permanently dedicated to open space totals approximately 4,090 acres. The largely developed study area has only a small amount of public open space and parks within its boundaries; however, it also offers privately owned public open spaces (POPOS), public waterfront areas, and several public plazas. A complete list of publicly owned parklands within 0.25 mile of the proposed project is given in Table 3.15-2. Notable parklands are described in further detail below. Some of these features are shown in Figure 3.15-1 in relation to the proposed project study area.

South Park. South Park is an approximately 1-acre, wooded neighborhood park with pedestrian sidewalks and benches and a children's play area. The park is encircled by South Park Street and is tucked within the blocks between Second, Third, Bryant, and Brannan Streets. The park, modeled after a square in London, was originally constructed in 1855 as the center of an exclusive residential community. It featured the first paved streets and sidewalks in San Francisco. The South Park neighborhood began to lose exclusivity after construction of Second Street, which made the area accessible to less-affluent residents. With the departure of the wealthier families, the City acquired the park in 1897 and opened it to the public. Over the years, although the neighborhood has undergone substantial changes, the oval park has remained unchanged and is still a central meeting place in the neighborhood. Access to the park is from four streets: mid-block between Bryant and Brannan Streets, where South Park Street connects to the west and east ends of the park; mid-block between Second and Third Streets, and where Jack London Alley connects to the north and south sides of the park. South Park is under the jurisdiction of the San Francisco Recreation and Park Department. The park is approximately 0.1 mile from the AC Transit bus storage facility, approximately 0.16 mile from the Third and Townsend Streets vent structure site and adjacent land development, and approximately 0.19 mile from the Second and Harrison Streets vent structure site.

Justin Herman Plaza. A 4.33-acre open plaza, this facility opened in 1972 at the eastern end of Market Street near the Ferry Building and the Embarcadero Center, a mixed-use development of retail, restaurants, and offices. The plaza is a popular lunchtime gathering place for nearby office workers, and hosts arts and crafts fairs throughout the year, lunchtime concerts during the summer, and an outdoor ice skating rink in the winter. Justin Herman Plaza is 0.2 mile from the nearest proposed project component site, the northern end of the underground pedestrian connector.

Rincon Park. Rincon Park is approximately 3 acres, located along The Embarcadero at Folsom Street, and is approximately 0.19 mile away from the nearest proposed project component sites for the extended train box, intercity bus facility, and adjacent land development. It was developed as part of the Rincon Point Redevelopment Plan. With the reconstruction of The Embarcadero roadway between Market and King Streets, improvements have been made along the Bay that provide increased public access and a

Table 3.15-2
Publicly Owned Parklands within 0.25 mile of the Proposed Project

Parkland	Type	Responsible Agency	Nearest Project Feature
China Basin Park	Park	Port of San Francisco	Vent Structure, Adjacent Land Development
Ferry Plaza	Plaza	Port of San Francisco	Extended Train Box
Giants Promenade	Promenade	Port of San Francisco	Rock Dowel
Harry Bridge's Plaza	Plaza	Port of San Francisco	Extended Train Box
Herb Caen Way	Promenade	Port of San Francisco	Rock Dowels
Mission Creek Garden	Park	Port of San Francisco	Vent Structure, Realigned Fourth and Townsend Street Station
Pier 14	Pier/Promenade	Port of San Francisco	Extended Train Box
Rincon Park	Park/Promenade	Port of San Francisco	Extended Train Box, Taxi Staging Area
South Beach Park	Park/Promenade	Port of San Francisco	Vent Structure, Adjacent Land Development, Rock Dowels
Willie Mays Plaza	Plaza	Port of San Francisco	Vent Structure, Adjacent Land Development
Street Park: Annie Street	Promenade	SF Department of Public Works	Taxi Staging Area, Widened Throat Structure, Bicycle and Controlled Vehicle Ramp
Street Park: Ecker Street	Promenade	SF Department of Public Works	Taxi Staging Area, Widened Throat Structure, Bicycle/Vehicle Ramp
Market/Battery Plaza	Plaza	SF Department of Public Works	BART/MUNI Underground Pedestrian Connector
Yerba Buena Gardens	Park	SF Office of Community Investment and Infrastructure	Rock Dowels, Widened Throat Structure
5th Street Plaza and Promenade	Plaza/Promenade	SF Office of Community Investment and Infrastructure	Vent Structure, Realigned Fourth and Townsend Street Station
Gap Building	Plaza	SF Office of Community Investment and Infrastructure	Extended Train Box, Taxi Staging Area
Jessie Street Plaza (Jewish Museum)	Plaza	SF Office of Community Investment and Infrastructure	Widened Throat Structure
Rincon Center	Mixed Use/Plaza	SF Office of Community Investment and Infrastructure	Extended Train Box
Yerba Buena Center	Plaza/Arts Center/ Museum	SF Office of Community Investment and Infrastructure	Rock Dowels, Widened Throat Structure, AC Transit Bus Storage Facility Parking
Mission Bay Park	Park/Promenade	SF Office of Community Investment and Infrastructure	Tunnel Stub Box, Vent Structure, Realigned Fourth and Townsend Street Station
Justin Herman/ Embarcadero Plaza[1]	Plaza	SF Recreation and Parks	Extended Train Box, BART/MUNI Underground Pedestrian Connector
Maritime Plaza[1]	Plaza	SF Recreation and Parks	BART/MUNI Underground Pedestrian Connector
South Park[1]	Park	SF Recreation and Parks	Rock Dowels
Esprit Park[1]	Park	SF Recreation and Parks	Additional trackwork south of the Caltrain railyard
Sue Bierman Park/Ferry Park[1]	Park	SF Recreation and Parks	BART/MUNI Underground Pedestrian Connector

Note:
[1] Property is recognized as a park land by the San Francisco Recreation and Parks Department
Source: City and County of San Francisco 2013

continuous pedestrian walkway (Herb Caen Way) between South Beach Harbor, Market Street, and points north. The park has grassy areas, a large sculpture of a bow and arrow, and expansive views of San Francisco Bay and the Bay Bridge. Rincon Park is owned by the San Francisco Recreation and Park Department.

South Beach Park. South Beach Park is an approximately 3-acre park located along The Embarcadero between King Street and China Basin (approximately 0.22 mile away from the nearest proposed project component, the vent structure at Third and Townsend Streets and the adjacent land development). Privately built by the South Beach Marina Association, the park offers a children's playground, grassy areas, and benches. South Beach Park adjoins the South Beach Harbor, a 690-berth marina for small boats. South Beach Park is owned by the Port of San Francisco.

China Basin/Mission Creek Park. To the south and west of South Beach Harbor is China Basin, a channel extending from San Francisco Bay inland to just east of Seventh Street and Interstate 280. The basin provides berths for sailboats, houseboats, and other moderately sized craft in the channel area west of Fourth Street. Mission Creek Park is approximately 15 acres, with portions bordering the north and south edges of China Basin Channel, also known as Mission Creek. The north side of Mission Creek Park is owned by the San Francisco Office of Community Investment and Infrastructure. The linear park runs parallel to Mission Creek, between Fourth and Seventh Streets, and features benches along the pathway, a public boat launch, sports courts, and a dog run area. Along the south bank of the basin, just outside of the proposed project area, is a linear community park called Mission Creek Park/Garden with a pedestrian way, community garden plots, benches, a small outdoor amphitheater, and a pavilion for special events. Mission Creek Park/Garden is owned by the Port Authority. The closest point of Mission Creek Park to the proposed project components is approximately 0.19 mile, to the realigned Fourth and Townsend Street Station and its eastern vent structure.

Esprit Park. Esprit Park is an approximately 1.83-acre park, occupying the block between Nineteenth, Twentieth, Minnesota, and Indiana Streets. It is a neighborhood park with a large, open, flat grass field, encircled by a pedestrian pathway, with benches for seating and fitness stations. The closest point of Esprit Park to a proposed project component is approximately 0.19 mile, to the Mariposa Avenue end of the additional trackwork south of the Caltrain railyard.

Privately Owned Public Open Spaces. In 1985, requirements were added to the San Francisco Downtown Plan for developers to provide publicly accessible open space as part of projects in Downtown Commercial Zone (C-3) districts. The goal is to create a sufficient variety of quality open spaces to meet the needs of downtown workers, residences, and visitors. Within the commercial office district in the vicinity of the Transbay Terminal are a number of privately developed plazas open to the public. These POPOS are publically accessible spaces in the form of plazas, terraces, atriums, small parks, and other spaces provided and maintained by private developers. Some are at street level and others are elevated and accessible by stairs or escalators. Six POPOS are adjacent to proposed project component sites:

- 135 Main Street features an interior lobby with seating.
- 201 Mission Street features seating along the building's setback.
- 235 Second Street features a plaza with 15 tables and 62 chairs served by a café.
- 299 Second Street features Marriot Courtyard benches and landscaping along the sidewalk.
- 611 Folsom Street features a brick plaza with trees, artwork, and seating.
- 303 Second Street features Marathon Plaza, which offers a large triangular urban garden with a water feature, seating, and landscaping.

Other Recreational Facilities. Recreational facilities near the proposed Caltrain station at Fourth and Townsend Streets include the San Francisco Tennis Club at 645 Fifth Street (approximately 0.08 mile away) and AT&T Park, a 45,000-seat baseball stadium on King Street between Second and Third Streets (approximately 0.07 mile away).

Schools

No public or private schools (grades K-12) are located in the study area. Post-high-school private schools and colleges are located within the study area, including Golden Gate University's main campus, which is located on Mission Street between First, Second, and Stevenson Streets. The campus includes administrative offices, classrooms, meeting facilities, and auditoriums. Approximately 5,000 full- and part-time undergraduate and graduate students attend (Golden Gate University 2014).

The Academy of Art College has academic facilities within the study area at 79 New Montgomery and Mission Streets and 180 New Montgomery and Howard Streets. Heald College has facility locations at Fremont and Mission Streets and on Howard Street near Third Street.

Religious Institutions

No religious institutions are located adjacent to the proposed project footprint. However, in the study area, several institutions serve the community, the nearest being Epic Church on 543 Howard Street (approximately 0.04 mile away). Other institutions include the Gran Oriente Filipino Masonic Temple located at 95 Jack London Alley (approximately 0.07 mile away), Rigpa San Francisco Center at 111 New Montgomery Street (approximately 0.11 mile away), Eucharist Church at 285 Main Street (approximately 0.12 mile away), and the Apostleship of the Sea at 399 Fremont Street (approximately 0.23 mile away).

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning public services and community facilities, including new guidance issued since the 2004 FEIS/EIR.

Federal

National Fire Protection Association Standard 130 (2014 Edition)

The nationally recognized codes for fire protection and life safety requirements for underground and surface transit and rail systems are produced by the National Fire Protection Association (NFPA). NFPA Standard 130 is the standard used nationwide for many aspects of transit system design. According to NFPA Standard 130, sufficient exit capacity must be provided to permit the evacuation of station occupants from platforms in 4 minutes or less. Evacuation must also be provided from the most remote point on a platform to a point of safety in 6 minutes or less. NFPA Standard 130 also includes provisions related to tunnel exit spacing and fire suppression systems.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on public services and facilities, parks, and other recreational facilities, and to avoid or mitigate those impacts when feasible.

California Public Park Preservation Act (California PRC Sections 5400 through 5409)

This act provides that a public agency that acquires public parkland for non-park use must either pay compensation that is sufficient to acquire substantially equivalent substitute parkland or to provide substitute parkland of comparable characteristics. If less than 10 percent of the parkland, but not more than 1 acre, is acquired, the operating entity may improve the portion of the parkland and facilities not acquired using the funds received.

California Building Code

The California Building Code (CBC) contains performance and configuration requirements regarding standpipes and other fire-suppression systems. Typically, the CBC takes precedence if specific provisions to the topic exist; otherwise, NFPA Standard 130 takes precedence. Starting in 1989, the California Building Standards Commission has published new editions of the CBC in its entirety every 3 years. The current version of the CBC is the 2001 code as amended in 2013. The CBC does not provide any additional guidance on exit spacing.

California Fire Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which includes regulations concerning building standards (as set forth in Title 24 of the CCR, the CBC), fire protection and notification systems, fire protection devices (such as fire extinguishers and smoke alarms), high-rise building and child-care facility standards, and fire-suppression training. California Fire Code Section 403.2 addresses public safety for indoor and outdoor gatherings, including emergency vehicle ingress and egress, fire protection, emergency medical services, public assembly areas, the directing of attendees and vehicles (including the parking of vehicles), vendor and food concession distribution, and the need for law enforcement and fire and emergency medical services personnel at events.

Local

San Francisco Police Code

The San Francisco Police Code, published within the San Francisco Municipal Code, contains regulations for various types of activities, such as automobile use, permitting and licensing, public nuisances, and disorderly conduct. The San Francisco Police Code provides specific regulations regarding nuisances, including street obstructions, trash and litter, and unnecessary noise. The SFPD prohibits unwanted, excessive, and avoidable noise, with specific guidance for noise limits for waste removal activities, construction equipment, and construction work at night, and issuing variances to these regulations. Furthermore, the police code includes guidance should the SFPD come into possession of hazardous property. The San Francisco Municipal Code is updated as amending legislation is approved.

San Francisco Fire Code

The San Francisco Fire Code, published within the San Francisco Municipal Code, is updated as amending legislation is approved, with revisions most recently enacted in 2013. The San Francisco Fire Code is designed to regulate and govern the safeguarding of life and property from fire and explosion hazards arising from the storage, handling, and use of hazardous substances, materials, and devices, and from conditions hazardous to life or property in buildings and on their premises. The fire code also regulates the issuance of permits, inspections, and other SFFD services, and provides for the assessment and collection of fees for those permits, inspections, and services. The SFFD reviews building plans to ensure that fire and life safety are provided and maintained in the buildings that fall under its jurisdiction. The SFFD building plan review applies to the following occupancy types that are relevant to the proposed project:

- assembly occupancies (including restaurants and other gathering places for 50 or more occupants);
- storage occupancies where the potential exists for high-piled storage, as defined by the San Francisco Fire Code;
- institutional occupancies; and
- fire alarm and fire suppression systems.

In coordination with the San Francisco Department of Building Inspection and the Port Building Department, the SFFD conducts plan checks to ensure that all structures, occupancies, and systems outlined above are designed in accordance with the San Francisco Building Code prior to the issuance of a building permit.

San Francisco General Plan

Relevant San Francisco General Plan policies and elements are listed below.

Policy 1.7. Combine police facilities with other public uses whenever multi-use facilities support planning goals, fulfill neighborhood needs, and meet police service needs.

Policy 2.1. Ensure that new construction meets current structural and life safety standards.

Policy 3.1. Promote greater public awareness of disaster risks, personal and business risk reduction, and personal and neighborhood emergency response.

Recreation and Open Space Element. This element describes different classifications of public open spaces in San Francisco, including the areas where they serve (i.e., Citywide, District, Neighborhood, and Sub-neighborhood), and provides goals and policies for these service areas. This element also includes policy to provide an adequate total quantity and equitable distribution of public open spaces throughout San Francisco, to the extent it reasonably can, given existing development patterns, high population density, and small land mass.

Downtown Area Plan and Streetscape Plan. This plan contains a set of guidelines for downtown open space that details the types of open space that is appropriate for downtown, and includes a list of preferred design elements. The 1994 Draft Downtown Streetscape Plan developed by the San Francisco Planning Department calls for "retaining the area in front of the Terminal or other suitable areas for much-needed open space," and "retaining a garden walk pedestrian connection and open space on the former freeway parcels south of the Terminal."

City Planning Code Section 139. This Planning Code section requires office uses in Downtown Commercial Zone C-3 districts to pay $2 per square foot to the Downtown Park Special Fund to create parks and recreational facilities in the central business district.

3.15.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios; or substantial adverse impacts associated with response times or other performance for any of the public services, including fire protection, police protection, schools, parks, or other public facilities; or

- increase the use of existing parks, open spaces, trails, or recreational facilities enough that substantial physical deterioration of the facility would occur or be accelerated, or require the construction or expansion of recreational facilities that may have an adverse physical effect on the environment.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, in which Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the effects on public services, community services, and recreational facilities will be the same as those presented in Section 5.4 Community Facilities and Services (pages 5-37 to 5-43) and Section 5.5 Parklands, Schools, and Religious Institutions (pages 5-43 to 5-45) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects and Mitigation Measures Saf 1, Saf 2, Saf 3, and PC 7, previously adopted and incorporated into the Transbay Program, is provided below. The full text of these mitigation measures is presented in Appendix C of this SEIS/EIR. The TJPA will comply with all applicable codes and regulations for safety and security. Additional discussion is included in Section 3.16, Safety and Security.

Police. In the 2004 FEIS/EIR, it was determined that the SFPD's Southern Station does not have sufficient police personnel to realign its staff and provide offices exclusively for the Transbay Program; however, the 2004 FEIS/EIR addresses this insufficiency by concluding that a funding arrangement between the TJPA and SFPD will ensure adequate police coverage at the new Transit Center. Some Transit Center police and protection services will be provided by security forces associated with the transit agencies using the facilities, such as AC Transit and Golden Gate Transit. To mitigate the increase in demand for police services, the following mitigation measure was adopted and incorporated into the project:

- **Saf 3** – prepare a risk analysis to accurately determine the number of personnel necessary to maintain an acceptable level of service at project facilities.

The 2004 FEIS/EIR concluded that the potential increase in police demand will have a no adverse effects/ less-than-significant impact on safety and emergency services with implementation of Mitigation Measure Saf 3.

Fire and Emergency Medical Services. The 2004 FEIS/EIR reported that the Transbay Program can affect the SFFD's level of service in the area; however, this increase in demand may be met through reorganization of existing staff or reliance on a fire station proposed in Mission Bay. In addition to

Mitigation Measure Saf 3, summarized above, the 2004 FEIS/EIR included the following mitigation measures that have been adopted and incorporated into the Transbay Program:

- **Saf 1** – provide project plans to the San Francisco Fire Department for its review to ensure that the adequate life safety measures and emergency access are incorporated into the design and construction of project facilities.

- **Saf 2** – prepare a life safety plan including the provisions of on-site measures such as a fire command post at the Terminal, the Fire Department's 800-megahertz radio system and all necessary fire suppression equipment.

The 2004 FEIS/EIR concluded that the No Action Alternative will have a no adverse effect/less-than-significant impact on service ratios, response times, and other performance measures for adequate fire and emergency medical services with implementation of Mitigation Measures Saf 1, Saf 2, and Saf 3.

In addition to the above mitigation measures, the TJPA prepared the Downtown Rail Extension (DTX) Design Criteria (TJPA, PMPC 2009). These criteria set forth the standards and regulations that will be followed in the design and construction of the DTX. These criteria, which are described in Chapter 2, Project Alternatives, and in Section 3.16, Safety and Security, address system safety and security, communications, signals and train control, and fire-life safety, all of which will further reduce potential effects on service ratios, response times, and other performance measures for fire and emergency medical services. The referenced codes include NFPA 130, so that the DTX will be designed to adhere to these standards.

Parks, Recreational Facilities, Schools, and Religious Institutions. The Transbay Program will create more than 11 acres of public open spaces to enhance the area, as follows:

- City Park, a 5.4-acre park at the top level of the Transit Center

- A public open plaza and grand staircase at the front entrance to the new Transit Center

- Two open spaces forming Fremont Square, a hardscaped plaza that would be adjacent to the new Transit Center

- Natoma Green, located between Minna and Natoma Streets to serve as a mixed-use educational and cultural center

- Essex Green, located between Tehama and Clementina Streets

- Additional open spaces such as pocket parks, sitting areas, and playgrounds

In an area in need of public open space, the No Action Alternative offers improvements over existing conditions.

No schools or religious institutions will be displaced, relocated, or disrupted by the Transbay Program, as indicated in the 2004 FEIS/EIR and as amended by the subsequent addenda. Increases in school enrollment as a result of the redevelopment component of the Transbay Program will increase demand for school facilities. Development fees capped by the state legislature, pursuant to Senate Bill (SB) 50, were identified as the mechanism for funding school construction and will mitigate any potential effects associated with implementation of the residential development. In addition, the 2004 FEIS/EIR concluded

that no long-term effects on religious facilities will occur because of their distance from the proposed Transbay Program improvements and facilities.

The 2004 FEIS/EIR determined that no long-term operational effects will occur to parks, schools, or religious institutions. Construction activities will cause limited short-term effects on nearby parks, schools, and religious institutions. These effects will include temporary increases in noise and dust, and temporary traffic detours, congestion, and street closures, as described below. Although it is possible that nearby open spaces will be used by construction workers, for example at lunch time, which can result in a minor temporary increase in use of these facilities, the additional use will not substantially contribute to the deterioration of these open spaces. The No Action Alternative will have a no adverse effect/less-than-significant impact on parks, schools, and religious institutions.

Emergency Service Delays and Other Effects during Construction. The 2004 FEIS/EIR concluded that none of the community facilities, including parks, schools, and churches, will be affected by construction activities, except to the extent that traffic delays caused by temporary detours and congestion may inconvenience people trying to gain access to these facilities. The San Francisco Police Department and other security personnel are expected to monitor traffic congestion and detours along surface streets during construction. The No Action Alternative will include construction activities that may result in street closures and traffic redirections, to provide public safety and accommodate construction zones, staging areas, and heavy-equipment access. Phase 1 of the Transbay Program is currently in progress, and some alterations to street access and traffic diversion already have been implemented. Therefore, most of the public is familiar with the existing condition of the construction area, and local agencies providing police, fire, and emergency services are already in communication with the TJPA to coordinate necessary traffic and safety measures. Measures to reduce emergency access impacts and safety hazards are Mitigation Measures Saf 1 and Saf 2, and the DTX Design Criteria, described above. In addition, 2004 FEIS/EIR Mitigation Measure PC 7 will provide adequate emergency service access during construction through the development of traffic management plans:

- **PC 7 –** develop traffic management plans to, among other things, maintain access to all businesses affected by surface or cut-and-cover construction, and include provisions in construction contracts to maintain access to businesses.

The 2004 FEIS/EIR concluded that construction activities will not significantly alter emergency services during construction or adversely affect public services and community facilities. The No Action Alternative will have a no adverse effect/less-than-significant impact with implementation of Mitigation Measures Saf 1, Saf 2, Saf 3, and PC 7.

Proposed Project

Because the proposed project components consist of Phase 2 refinements, other transportation improvements, and land development at or adjacent to elements of Phase 2 of the Transbay Program, the 2004 FEIS/EIR addresses nearly all of the potential impacts that are likely to result from implementation of the proposed project on public services, community services, and recreational facilities. The assessment below is, therefore, substantially similar to the 2004 FEIS/EIR, although more current information and technical analyses have been incorporated to refine potential impacts for the proposed project component sites.

Mitigation Measures Saf 1, Saf 2, Saf 3, and PC 7 were identified in the 2004 FEIS/EIR and were previously adopted and incorporated into the Transbay Program to reduce impacts on demand for police, fire, and emergency medical services, as well as to ensure emergency access during construction through the development of traffic management plans. These mitigation measures would also apply to the public services and community services impacts identified for the proposed project, and would be implemented

as part of the proposed project. The full text of these measures is presented in Appendix C of this SEIS/EIR.

Impact PS-1: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 fire protection, police protection, and emergency services. (No Adverse Effect/Less-than-Significant Impact)

The proposed project involves various components, some of which would have no effect on fire protection, police protection, or emergency services. Operation of the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, vent structures, and tunnel stub box would allow safe, efficient movement of the DTX, and would not alter residential development or employment in the proposed project area that could affect the need for or use of public services. Consequently, these proposed project components would not affect police patrol, fire suppression, or emergency services, and no further discussion of their potential operational effects on such facilities is needed in this SEIS/EIR. The ventilation shafts and emergency exits are integral components of the DTX life safety system, and, consequently, would support fire and emergency responder access and evacuation of passengers from underground. In particular, the TJPA will comply with and implement the NFPA 130 standards that govern fire protection and life safety requirements for underground and surface transit and rail systems.

The following analysis focuses on the proposed project components that could affect public services.

Proposed Project Components related to Transit Center Access. The proposed project would involve changes to the Transit Center access locations because of the intercity bus facility, the bicycle/controlled vehicle ramp, and the underground pedestrian connector. These facilities would enhance intraregional and interregional transit connections that would attract additional passengers to the Transit Center. The incremental amount of passenger traffic would be expected to increase demand for police, fire, and emergency services in the proposed project area; however, compared to the overall anticipated traffic associated with the entire approved Transbay Program, the new demand associated with these proposed project components would be minor and addressed by the mitigation measure identified in the 2004 FEIS/EIR (Mitigation Measure Saf 3).

Taxi Staging Area. The taxi staging area would provide a means for passengers already using the Transit Center to reach their destinations. The queues of passengers waiting to catch a taxi could present an opportunity for criminal activities, and thus increase calls for law enforcement. This potential is not anticipated to be any greater than at other transit facilities, and Transit Center patrols, surveillance, and lighting would be expected to deter unlawful acts. In general, taxis idling on the street and dropping passengers off can cause traffic disruption and associated hazards. The taxi staging area would allow taxi service companies to wait for fares in a designated area, allowing clearer passage for fire and emergency services on nearby roads. Therefore, it is anticipated that the taxi staging area would not adversely affect response times for police, fire, or emergency services.

AC Transit Bus Storage Facility Parking. The AC Transit bus storage facility parking would provide nighttime and event parking when AC Transit buses are not using the facility. Parking lot staff and security lighting would serve as deterrents to unlawful activities that could increase calls for law enforcement. The parking lot would not be expected to affect response times.

Additional Trackwork South of the Railyard. The use of the turnback tracks to move trains between the Caltrain railyard and the Transbay Transit Center would require the crossing gate at 16th Street to be

lowered for approximately 70 seconds to move the train to the end of the turnback track, and another 70 seconds to move the train north, back toward the mainline. Minor delays may occur if the 16th Street gate crossings are down, but they would not differ substantially from typical delays that currently occur at this crossing location. In addition, police, fire, and emergency services vehicles use multiple routes, depending on the time of day, traffic conditions, and availability of other roadways nearby, such as Mariposa Street and Mission Bay Drive that could provide alternate east-west access for emergency vehicles. Therefore, the additional trackwork and associated operations south of the Caltrain railyard would not be expected to affect emergency response times.

Adjacent Land Development. The only proposed project component that would result in an increased call for police, fire, or emergency services is the potential land development that could be co-located with the intercity bus facility and with the vent structures at Third and Townsend Streets and at Second and Harrison Streets. Residential uses could be developed at all three locations, potentially resulting in up to 292 dwelling units with an associated demand for public services. This proposed project component would be served by the same services and from the same facilities that already exist in the area. Mitigation Measures Saf 1, Saf 2, and Saf 3, identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would apply to the proposed project, thereby reducing the potential for impacts to occur. As indicated in Mitigation Measure Saf 1, the TJPA will provide project plans to the SFFD to ensure that adequate life safety measures and emergency access are incorporated into the design and construction of the project. For these reasons, the potential increase in demand for police, fire, and emergency medical services resulting from the increase in population and employment associated with the proposed project is not expected to result in inadequate staffing levels or require new or physically altered police, fire, or emergency medical facilities. Consequently, the adjacent land development would not have an indirect adverse effect under NEPA and would have a less-than-significant impact under CEQA.

Impact PS-2: The proposed project would not adversely affect existing parks, open spaces, trails, recreational facilities, schools, or religious institutions; include construction of new recreation facilities; or conflict with applicable plans and policies. (No Adverse Effect/Less-than-Significant Impact)

Parks. The proposed project would not create additional recreation facilities, other than those already planned and approved under the No Action Alternative, or require the construction or expansion of recreation facilities that may have an adverse physical effect on the environment. The additional development, whether office and/or residential uses, would increase the demand for local parks and recreational facilities. Given the scale of possible development—up to a maximum of 600 additional residents or 400 additional employees—the demand would not be substantial. Office staff would be expected to use local open spaces, POPOS, and plazas, for example, to take lunch breaks. This type of use results in relatively little impact and would not tend to result in substantial deterioration of open spaces that could rise to the level of significance. Similarly, some use of local recreational facilities would be expected, but the demand would not necessarily result in their accelerated deterioration. The population/employment increase is only one factor that affects whether parks and recreational facilities would deteriorate through increased use. Other factors include park design, accessibility, users' age, type of facilities and programs, and maintenance (City of San Francisco 2012).

The proposed project would not conflict with recreation and open space plans and policies from the City's General Plan or area plans that encompass the proposed project area (see Figure 3.3-4 in Section 3.3, Land Use and Planning, Wind, and Shadow, of this SEIS/EIR). On the contrary, the Transbay Program includes the addition of more than 11 acres of open space, plazas, and recreational areas. None of the proposed project components would require encroachment onto public parklands. The DTX alignment

would be underground in the section where it passes near South Park, so there would be no anticipated impacts to the functionality of the parkland.

The proposed project would encroach on the setback used by the privately owned public open space at 235 Second Street, containing a street-level plaza with seating and tables adjacent to a café. This would reduce the amount of open space at this location; however, this is a privately owned open space, and the proposed project would create a number of open space features that would otherwise not be available. Consequently, the proposed project would have a no adverse effect/less-than-significant impact on parks.

Schools. The proposed project would not result in a substantial increase in demand for school facilities because the increase in the population of school-age children in new residential units under the proposed project would be relatively small. If this increased population required construction or expansion of school facilities, SB 50 mitigation, which would mitigate any impact on schools to a less-than-significant level, would apply to the proposed residential projects. Consequently, the proposed project would have a no adverse effect/less-than-significant impact on schools.

Impact C-PS-3: Construction of the proposed project would result in temporary effects on emergency response and may interfere with access to parks and community facilities, but this effect would be reduced with implementation of previously adopted mitigation measures and the DTX Design Criteria. (No Adverse Effect/Less-than-Significant Impact)

Emergency Service Delays and Other Effects during Construction. Phase 1 of the Transbay Program is currently under construction, and traffic diversions and some alterations to street access have already been implemented. Accordingly, much of the public is familiar with the existing conditions in the construction area, and local agencies providing police, fire, and emergency services are already in communication with the TJPA to coordinate necessary traffic and safety measures. In addition, as described in Impact C-TR-7 (in Section 3.2, Transportation, of this SEIS/EIR), contractors would follow Regulations for Working in San Francisco Streets ("The Blue Book"), and would provide reimbursement to the San Francisco Municipal Transportation Agency for installation and removal of temporary striping and signage required during construction. Furthermore, all construction activities would be conducted consistent with previously adopted Mitigation Measure PC 7 from the 2004 FEIS/EIR and the DTX Design Criteria and construction management plan. The DTX Design Criteria, developed by the TJPA for use in the design and construction of DTX-related facilities, includes a section specifically devoted to the maintenance and protection of traffic (TJPA, PMPC 2009). The traffic plan would set forth guidelines and standards for road closures, pedestrian and bicyclist detours, access to businesses and residences and for emergency response vehicles, temporary traffic controls, and signage. Therefore, emergency response could be affected during construction, but implementation of the construction management plan and notification of the location and duration of construction activities to emergency responders would allow alternate routes to be identified. Consequently, the proposed project would have a no adverse effect/less-than-significant impact on emergency services during construction.

Disruption to Community Facilities. Construction of the proposed project would result in street closures, detours, and construction staging activities that could restrict access to parks and other community facilities in the proposed project area. Similarly, construction activities would generate noise and dust that could disrupt activities or programs offered by community facilities. The footprint of the proposed project disturbance area would not include any parks or recreation facilities. South Park, the nearest public park owned and maintained by the City Department of Recreation and Parks, is set back approximately 150 feet from the construction area and would be accessible from other streets. Noise and dust would be noticeable, but mitigation adopted from the 2004 FEIS/EIR and incorporated into the Transbay Program would apply to the proposed project (see summary listing below) and would allow continued use of the park. Heavy construction equipment would not be expected in the stretch where

access to the park from Second Street exists, because construction for the DTX in this segment of Second Street would involve mining and not the more disruptive cut-and-cover construction method. Consequently, the proposed project would have a no adverse effect/less-than-significant impact on community facilities during construction.

Access to other businesses and community facilities would be maintained throughout construction to the extent feasible, in accordance with Mitigation Measure PC 7. In addition, other construction-related mitigation measures that were identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program would be implemented as part of the proposed project. These measures would reduce disruption to community facilities:

- **NoiC 1** – requires compliance with the City noise ordinance, which imposes limits on construction hours and maximum noise levels from any piece of powered construction equipment.

- **NoiC 4, PC 5, and PC 6** – require implementation of an active community liaison program to inform residents of construction plans so that they can plan around periods of particularly high noise levels and can register concerns and complaints.

- **NoiC 5** – requires contractors to employ best management practices that include performing construction in a manner to maintain noise levels at noise-sensitive land uses below specific limits, and limiting construction activities during evening, nighttime, weekend, and holiday periods.

- **PC 2** – requires contact with local businesses to understand how they carry out their work to minimize effects on business usage, delivery/shipping patterns, and critical times for business activities.

- **AC 2 through AC 8** – require implementation of construction best management practices to reduce air emissions, including fugitive dust.

- **AC 9 through AC 13** – impose restrictions on construction equipment that reduce air emissions and odors.

Cumulative Analysis

Impact CU-PS-4: Operation of the proposed project, in combination with reasonably foreseeable development, would not result in significant impacts related to public services, community services, and recreational facilities. (No Adverse Effect/Less-than-Significant Impact)

The geographic context of the cumulative community facility impact analysis is defined as the area within the Transbay Program; Transit Center District Plan; and Central SoMa, Eastern SoMa, and Mission Bay North Plans. The 2004 Eastern Neighborhoods Rezoning and Area Plans concluded that no substantial or accelerated deterioration of existing recreational resources would occur as a result of the area plan, nor require the construction or expansion of recreational facilities that may have an adverse effect on the environment. Although the increased housing options from the area plan would result in an increase in demand for public services, the 2004 Eastern Neighborhoods Rezoning and Area Plans concluded that the anticipated increase in population would not result in significant adverse physical effects on the environment and these public service requirements would be addressed in a community needs assessment and public benefits recommendation. The Transit Center District Plan EIR, which encompasses much of the proposed project area, including the majority of the potential residential development sites, indicates that the incremental daytime residential population and new employment base would not necessitate the need for new park or other governmental facilities, including police stations, fire stations, emergency medical

facilities, or schools (City of San Francisco 2012). Consequently, the proposed project in combination with other development in the area would have a no adverse effect/less-than-significant impact on public services, community services, and recreational and other public facilities.

Impact CU-PS-5: Construction of the proposed project, in combination with reasonably foreseeable development, would not result in significant cumulative impacts related to public services, community services, and recreational facilities. (No Adverse Effect/Less-than-Significant Impact)

Construction of the proposed project would occur over 4.5 years and would be concurrent with other construction activities in the proposed project area. The cumulative effect of street closures, detours, truck movements, and air and noise emissions from construction equipment, without mitigation, would substantially alter emergency response in and through the area, and disrupt the activities and programs offered by the varied community facilities shown in Figure 3.15-1. Although the proposed project, in conjunction with construction of other reasonably foreseeable projects, would disrupt traffic during construction, the SFPD, SFFD, and other emergency services are expected to be able to continue operating at their current capacity in the proposed project area without substantially altering response times or performance measures, with implementation of Mitigation Measure PC 7. Development projects are subject to the City's construction management plan requirements that focus on public safety and traffic controls. In addition, for the Transbay Program and the proposed project, the TJPA will coordinate with local services as needed to plan construction zones and alternative traffic routes. Ongoing dialogue with the SFPD and SFFD would occur to address specific construction-related concerns. Accordingly, emergency response would be adversely affected, but the cumulative effects would be considered less than significant given the required level of coordination with emergency service providers, the grid street pattern in the proposed project area that affords multiple routes, and the multiple emergency support facilities in the vicinity.

The construction activity locations and processes, and the type of construction equipment used for the proposed project, would not change significantly from the assumptions used in the 2004 FEIS/EIR. Although these construction effects may occur near public facilities such as parks, schools, or other community and recreation facilities, these effects would be minor and temporary. Compliance with City ordinances regulating noise, air emissions, and construction-related traffic, as well as the mitigation measures identified in the CEQA documents for the Transbay Program; the Transit Center District Plan; and the Central SoMa, Eastern SoMa, and Mission Bay North Area Plans, would reduce the impacts on parks and community facilities and services in the area. Also, the mitigation measures identified for Impact C-PS-3 from the 2004 FEIS/EIR (Mitigation Measures NoiC 1, NoiC 4, NoiC 5, PC 2, PC 5, PC 6, PC 7, and AC 2 through AC 13) would be implemented as part of the proposed project.

The proposed project's new area of construction (i.e., not covered by the approved Transbay Program footprint) is at Third and Townsend Streets, a proposed construction staging site and eventual site for a vent structure and adjacent development. Construction activities at this location would include demolition, excavation, foundation, and structure construction. As shown in Figure 3.15-1, no community facilities are in the immediate vicinity of this proposed project component. Construction effects associated with these activities would not substantially differ from those already occurring for construction of the Transit Center. As a result of the relatively small scale of the proposed project construction, the implementation of mitigation measures adopted from the 2004 FEIS/EIR and incorporated into the Transbay Program, and the absence of community facilities near the Third and Townsend Streets construction and staging area, the proposed project's contribution to construction effects on parklands and community facilities would not be cumulatively considerable, and impacts would be less than significant. No additional mitigation measures would be required for the proposed project beyond those already identified. Consequently, the proposed project in combination with other development in the area would have a no adverse effect/less-than-significant impact on public services, community services, and recreational and other public facilities during construction.

3.15.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Public Services, Community Services, and Recreational Facilities (Not Adverse)	The 2004 FEIS/EIR concluded that project-related potential increases in demand for police, fire department, and emergency medical resources would result in no adverse effects with implementation of the 2004 FEIS/EIR Mitigation Measures Saf 1, Saf 2, and Saf 3, PC 2, PC 5 through 7, NoiC 1, NoiC 4, NoiC 5, and AC 2 through AC 13, previously adopted and incorporated into the Transbay Program, and a funding arrangement between the TJPA and SFPD. The proposed project analyzed in this SEIS/EIR would not result in adverse operational or construction-related effects related to emergency response, parklands, schools, or religious or other institutions. Therefore, the proposed project would not result in any new adverse effects not identified in the 2004 FEIS/EIR or change the effects in the 2004 FEIS/EIR. No additional mitigation measures beyond those adopted as part of the 2004 FEIS/EIR and incorporated into the Transbay Program would be required for the proposed project.
CEQA Summary	
Impact PS-1: Demand and Impact on Fire, Police, and Emergency Response Services (Less than Significant)	The 2004 FEIS/EIR concluded that project-related potential increases in demand for police, fire department, and emergency medical resources would result in a less-than-significant impact with implementation of the 2004 FEIS/EIR Mitigation Measures Saf 1, Saf 2, and Saf 3 previously adopted and incorporated into the Transbay Program, and a funding arrangement between the TJPA and SFPD. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts for these public services. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond Mitigation Measures Saf 1, Saf 2, and Saf 3 adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program would be required for the proposed project.
Impact PS-2: Demand and Impact on Recreational and Other Community Facilities (Less than Significant)	The 2004 FEIS/EIR reported that the Transbay Program would create new public open space; no schools or religious institutions would be displaced, relocated, or disrupted; and SB 50 mitigation would address any new demand for school facilities. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts on these community facilities. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were identified in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact C-PS-3: Construction Impacts (Less than Significant)	The 2004 FEIS/EIR reported that no community facilities, parks, schools, or churches would be affected by construction activities, except to the extent that traffic delays caused by temporary detours and congestion may inconvenience persons using these facilities. The proposed project analyzed in this SEIS/EIR would result in less-than-significant impacts on these public services and community facilities. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond the 2004 FEIS/EIR Mitigation Measures Saf 1 and 2, PC 2, PC 5 through 7, NoiC 1, NoiC 4, NoiC 5, and AC 2 through 13 previously adopted and incorporated into the Transbay Program would be required for the proposed project.
Impact CU-PS-4: Cumulative Operational Impacts (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative impacts on demand, access, or use of public services, community services, and recreational and other public facilities. The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.
Impact CU-PS-5: Cumulative Construction Impacts (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative construction impacts on public services, community services, and recreational and other public facilities. The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.

3.16 SAFETY AND SECURITY

3.16.1 Introduction

The Transit Center will serve as a major inter-modal terminal that will provide linkages to several modes of transportation, and will be surrounded with increasingly dense development in the future. The proposed project involves rail, transit, and vehicular transportation improvements that would result in an influx of commuters, visitors, pedestrians, and passengers using the Transit Center and adjacent facilities. Safety and security specifically addresses the potential for accidents, such as derailment and collisions; personal safety on vehicles, at stations, or in parking lots; and security risks. The focus of this section is on how the proposed project may affect safety and security and whether safety and security conditions have changed since approval of the 2004 FEIS/EIR.

The potential for the proposed project to affect police, fire, and emergency services is evaluated in Section 3.15, Public Services, Community Services, and Recreational Facilities, of this SEIS/EIR. Discussion of emergency access is included in Section 3.2, Transportation.

3.16.2 Affected Environment

Safety and Security in the Proposed Project Area

Safety refers to the prevention of accidents to the riding public, employees, and others present near the project area. Transit vehicle accidents may be caused by events such as fires; faulty equipment; improper boarding or alighting of the transit vehicles; or conflicts between trains, buses, automobiles, pedestrians, and non-motorized vehicles. Security refers to the prevention of unlawful acts resulting in harm to persons or damage to property. In a broader sense, security also implies freedom from threats or uncertainty about the likelihood of threatening acts.

Safety

The local police force and the California Highway Patrol have legal jurisdiction over the Transit Center and provide law enforcement officers. The San Francisco Police Department (SFPD) is responsible for general law enforcement in the proposed project area, with daily auto and foot patrols. The SFPD's Southern Station, at 850 Bryant Street, is the closest police protection services facility to the proposed project area. Two fire stations are in the proposed project area that can offer emergency response in the event of an accident: Station 1 at 676 Howard Street and Station 8 at 36 Bluxome Street. Five other stations are nearby. Other security and enforcement agencies with jurisdiction in or near the proposed project area include Amtrak, whose security officers police Caltrain vehicles and patrol Caltrain station and parking areas, and BART police, who patrol the Embarcadero and Montgomery BART stations within the vicinity. AC Transit and Golden Gate Transit also have security personnel in the vicinity of the Transit Center to monitor their facilities. Additional details regarding police and fire services are presented in Section 3.15, Public Services, Community Services, and Recreational Facilities.

Security

In 2012, the TJPA undertook a comprehensive risk assessment of the Transbay Program's in-progress design documents to establish comprehensive design guidance criteria for completion of the Transit Center design. The purpose of the risk assessment was to identify and evaluate security risks to the Transit Center and develop measures to mitigate them. The enhancements and guidance developed generally correspond to standards and best practices developed by the U.S. Department of Homeland Security's Interagency Security Committee. Other well-known industry-accepted security standards that

meet or exceed those of other transit facilities were also used as a precedent to develop recommendations to address the unique security requirements of the Transit Center.

Downtown Rail Extension Design Criteria

The TJPA adopted program-wide design criteria that govern design, construction, and operation of the Downtown Rail Extension (DTX) and related facilities. These criteria define the standards, codes, and guidelines that are being implemented and enforced by the TJPA. The criteria address a number of safety and security considerations, and serve to avoid and minimize the potential for accidents and security risks. In particular, the following chapters from the DTX Design Criteria are relevant to protecting life and property:

- Chapter 3, System Safety and Security, provides system safety management, reliability assurance, and safety certification requirements and specific design criteria for project security. They require the TJPA to prepare a Safety and Security Management Plan that complies with Federal Transit Administration (FTA) Circular 5800.1 (August 1, 2007) and they define specific safety and security activities that a recipient of FTA funding must perform.

- Chapter 16, Communications, provides criteria for the communication system, including backbone network requirements and system requirements for passenger amenities and security.

- Chapter 17, Signals and Train Control, contains supplemental design criteria for system signaling and safe train operations.

- Chapter 22, Fire-Life Safety, provides criteria to ensure the safety and well-being of passengers and employees through fire detection, alarm, and suppression systems; emergency lighting and tunnel ventilation; firefighter air systems; and emergency egress and exit signage.

- Key proposed project features, such as the ventilation shafts, emergency exits, fan systems, and emergency generators, would be constructed to satisfy these criteria.

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning safety and security, including new guidance issued since the 2004 FEIS/EIR.

Federal

Executive Order 13224

Executive Order 13224 authorizes the U.S. Treasury to designate and block the assets of foreign individuals and entities who commit, or pose a significant risk of committing, acts of terrorism. Executive Order 13584 focuses on collaborative work among executive departments and agencies to bring together expertise, capabilities, and resources to realize efficiencies and better coordination of U.S. Government communication investments to combat terrorism and extremism.

U.S. Department of Homeland Security

The Intelligence Reform and Terrorism Prevention Act of 2004 established the position of Director of National Intelligence, the National Counterterrorism Center, and the Privacy and Civil Liberties Oversight Board. Title 4: Transportation Security, addresses aviation, air cargo, and maritime security, as well as the national strategy for transportation security and other general provision.

U.S. Department of Transportation

In 2003, the FTA published the Public Transportation System Security and Emergency Preparedness Planning Guide, which addresses the vulnerability of critical infrastructure to major events, including terrorism, and identifies practical steps that transportation systems can take to better prepare for all emergencies. The guide was prepared to support the activities of public transportation systems to plan for and respond to major security threats and emergencies. It emphasizes the importance of developing critical relationships, preparing strategies and policies, and setting training and funding priorities. It offers practical guidance for planning effectively, spending wisely, and making the public transportation infrastructure safer (FTA 2003).

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on public safety and public services, and to avoid or mitigate those impacts when feasible.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates safety for public transit systems throughout California. The CPUC provides specifications for design details such as clearances, grade crossings, vehicle design, operating speeds, right-of-way standards, fire protection, and operating rules. The CPUC also oversees safety management programs for transit agencies such as internal safety audits, reporting accidents, and developing safety programs.

Local

San Francisco General Plan

The City's General Plan Community Safety Element (City of San Francisco 2012a) establishes policies to guide the City's actions in preparation for, response to, and recovery from a major disaster. The policies of the element are intended to direct all City actions; to reduce social, cultural, and economic dislocations from disasters; and to assist and encourage the rapid recovery from disaster. The element also sets forth the responsibilities of City departments that implement these policies.

San Francisco Hazard Mitigation Plan

The San Francisco Department of Emergency Management (DEM) leads the City in planning, preparedness, communication, response, and recovery for daily emergencies, large-scale citywide events, and major disasters. DEM also oversees and coordinates the preparation of the City's Hazard Mitigation Plan that identifies natural and human-made hazards in the City and actions to reduce or eliminate risk to human life and property from hazards such as earthquakes, floods, or terrorist attacks. The DEM and other City departments have completed a draft update of the City's Hazard Mitigation Plan, dated January 2014. The existing plan was approved in 2009 and must be updated every 5 years. The Hazard Mitigation Plan contains information on risks and vulnerabilities the City faces with respect to natural and human-caused hazards, noting that the City meets all of the criteria for being a high-value target. A key regulatory tool identified by the Hazard Mitigation Plan is the City's Emergency Response Plan, which describes the role of the Emergency Operation Center and the co-ordination between the Emergency Operation Center and the City department and other agencies responsible for emergency response.

3.16.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- Result in a substantial potential for accidents, such as train collisions or derailments;
- Result in substantial potential safety risk for individuals on vehicles, at stations, or in parking lots; or
- Result in unacceptable potential security risks or threats.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, safety and security effects will be the same as those presented in Section 5.17 (pages 5-121 to 5-122) of the 2004 FEIS/EIR and subsequent addenda. A summary of those previously analyzed effects is provided below.

Potential for Accidents. The separation of Muni, AC Transit, SamTrans, and other public and privately operated buses and trains from the street level will reduce conflicts between these transit modes and pedestrians, except at the platform, and bus loading areas. Conflicts between the various transit modes and trains at at-grade crossings will not occur because the train movements will occur within the existing right-of-way. Because of the reduction in potential conflicts, the potential for accidents, such as train collisions and derailments, was not further addressed in the 2004 FEIS/EIR.

Safety Concerns. The SFPD and San Francisco Fire Department (SFFD) are responsible for safety in the Transbay Program project area. The Transit Center's bus and train loading areas and passageways will be lighted and will have designated walkways for pedestrians. Fire sprinklers, stand pipes, smoke/gas detectors, and alarm systems will be placed throughout the Transit Center and train stations per SFFD requirements. The 2004 FEIS/EIR concluded that no substantial potential will exist for safety concerns, and a no adverse effect/less-than-significant impact will occur.

Security Threats. The TJPA will own and operate the Transit Center and DTX tunnel. Operation of the trains, tracks, signals, and related components will be the responsibility of the rail operators. Caltrain station security currently is provided by the Peninsula Corridor Joint Powers Board via a contract with Amtrak. BART police are responsible for security at BART stations within the project area, and San Francisco Municipal Transportation Agency has a work order with the SFPD to provide security at all transit stations, including a contract for private security guards. AC Transit and Golden Gate Transit also have security personnel to monitor their facilities in the vicinity of the Transit Center. In the 2004 FEIS/EIR, security was assumed to increase commensurate with the increase in the amount of transit activity at the Transit Center and DTX. The Transit Center's bus and train loading areas and passageways will be open and clearly lighted, and clear sight lines will be maintained. The 2004 FEIS/EIR concluded that no unacceptable potential will exist for security threats, and a no adverse effect/less-than-significant impact will occur.

Construction. Best management construction practices are required to provide for the safety of construction workers, local residents, and employees during project construction. Fencing and lighting of construction and staging areas, and recognized safety practices for the use of heavy equipment and the movement of construction materials will be implemented. During construction, the construction manager will be responsible for job site safety and security. Emergency response personnel in San Francisco will

be available for immediate response on an as-needed basis. The 2004 FEIS/EIR concluded that construction activities will have a no adverse effect/less-than-significant impact on safety and security.

Proposed Project

Because the proposed project consists of Phase 2 refinements and other transportation improvements and land development at or adjacent to elements of Phase 2 of the Transbay Program, the 2004 FEIS/EIR addresses the safety and security concerns that are directly relevant to the proposed project. Therefore, the following assessment is substantially similar to that in the 2004 FEIS/EIR.

Impact SS-1: The proposed project would not result in a substantial potential for accidents, such as train collisions and derailments. (No Adverse Effect/Less-than-Significant Impact)

The approved Transbay Program calls for the DTX to be fully below-grade, operating within its own right-of-way. The DTX would not have any at-grade crossings or any potential to result in accidents with surface street vehicles or pedestrians. The proposed project would not change this underground alignment for future Caltrain and high-speed-train service.

Potential accident risks as a result of the proposed project components are described below.

DTX Refinements. The proposed DTX refinements include a widened throat structure within the DTX, an extended train box at the Transit Center, vent structures, a tunnel stub box constructed beneath the U-wall, installation of rock dowels during the tunnel segment construction, and additional trackwork south of the Caltrain railyard.

- The widened throat structure would provide sufficient curve radius entering the train box to enable high-speed rail access into and out of the Transit Center.

- The extended train box would provide sufficient space for high-speed train service and would have minimal effects on safety conditions.

- The realigned Fourth and Townsend Street Station would improve Caltrain operations and enhance wayfinding and orientation for passengers, and would have minimal effects on safety conditions.

- The emergency ventilation/smoke evacuation structures would be co-located with emergency tunnel exits. If an accident or other emergency occurs within the below-grade DTX, the reversible fans within these emergency structures would enable smoke to be removed from underground facilities, and passengers would be evacuated from the tunnel via the emergency structure stairway. Police, fire, and emergency services would be able to access the Transit Center or DTX via the emergency structure stairways. Consequently, this proposed project component is specifically intended to meet DTX safety design criteria, National Fire Protection Association 130 standards, and City emergency requirements.

- The tunnel stub box would be constructed under the U-wall to enable below-grade Caltrain and high-speed trains. As a result, this proposed project component would allow for safer underground operations compared to current Caltrain at-grade operations.

- Installation of the rock dowels during construction of the mined tunnel from the Townsend Street curvature and along Second Street would assist with stabilization of the tunnel during construction, and would reduce risks to construction workers.

- The additional trackwork south of the Caltrain railyard would be required to allow trains to move between the railyard and the Transit Center, and would be long enough to avoid blocking any street crossings as the train is reversing direction. All train movements would be accommodated entirely within the Caltrain right-of-way. Although this proposed project component would increase the distance of crossing, changes to the signal timing and other modifications at the 16th Street crossing for the PCEP, and further design review by the Caltrain Peninsula Joint Powers Board, the TJPA, and the City would accommodate the additional crossing time and would reduce potential conflicts between buses/trains and pedestrians.

Although the DTX refinements listed above include components that would have either no effect or beneficial effects on system safety, a minimal risk still would exist for the potential for accidents with implementation of the proposed project. Therefore, an effect/impact could occur, but it would not be considered adverse or significant.

Other Transportation Improvements. Other proposed project components include transportation improvements such as the intercity bus facility, taxi staging area, bicycle/controlled vehicle ramp, AC Transit bus storage facility parking, and BART/Muni underground pedestrian connector. None of these alterations would substantially contribute to safety effects since they each represent routine transportation improvements and would comply with City regulations for design. The proposed BART/Muni underground pedestrian connector would remove pedestrian traffic from heavily used crosswalks and intersections, and could reduce the potential for accidents involving pedestrians. Therefore, the safety impacts as a result of other transportation improvements would be neither adverse nor significant.

Adjacent Land Development. The proposed adjacent land development would allow residential, commercial, and office space to be constructed next to proposed project transportation facilities. This development is typical urban development, similar to that occurring throughout the South of Market area (SoMa) of the City, and there would be no reason to anticipate that this proposed project component would result in more accidents or safety concerns. Therefore, the safety impact as a result of land development adjacent and co-located with the intercity bus facility or the vent structure at Third Street and Townsend Street would be neither adverse nor significant.

Impact SS-2: The proposed project would not result in substantial potential safety risks for individuals on vehicles, at stations, or in parking lots. (No Adverse Effect/Less-than-Significant Impact)

The proposed project components would be designed and operated in accordance with existing standards and guidelines that address safety design requirements. The DTX Design Criteria sets forth a number of these measures and features that must be included in the proposed project design, such as surveillance systems using closed-circuit television to monitor station areas and parking structures; slip-resistant surfaces; fencing to protect the DTX trackway, substations, vent structures, and the Fourth and Townsend Street Station and to maintain security; and fire protection devices, such as standpipe and hose systems (TJPA, PMPC 2009).

Potential safety hazards for passengers as a result of proposed project components are described below.

DTX Refinements. The proposed project components, which include the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, rock dowels, and additional trackwork south of the Caltrain railyard are necessary for HSR service and to improve train operations, facilitate future development and underground train service, or reduce construction risks during tunnel mining. Consequently, none of these proposed project components directly affect passenger safety on vehicles, at stations, or at parking lots. These proposed project components would have no effect on passenger safety. In addition, the vent structures are specifically proposed for fire safety

purposes, and would be an essential feature for passenger and employee safety. This proposed project component would contain a shaft, electrical room, fan room, emergency generator, and stairway to tie into the DTX tunnel. In a fire or other emergency in the below-grade DTX, the reversible fans within these emergency structures would enable smoke to be removed from underground facilities, and passengers would be evacuated from the tunnel via the emergency structure stairway. The proposed project would have a no adverse effect/less-than-significant impact related to potential safety risks for individuals on vehicles, at stations, or in parking lots.

Other Transportation Improvements. The other transportation improvements of the proposed project include the intercity bus facility and BART/Muni underground pedestrian connector that would be used by pedestrians and bus and rail passengers. These facilities would be patrolled, lighted, and signed to direct pedestrians and passengers. There is nothing inherent in these proposed project components or their operations that would pose an unusual safety concern.

- The taxi staging area would be located on an existing or proposed street, and would not result in a new or unusual safety concern for passengers and/or passersby along the sidewalks.

- The bicycle/controlled vehicle ramp could create conflicts between bicycles, pedestrians, and vehicles traveling along Howard Street. However, compliance with City standards regarding driveway ingress and egress and safe sightlines would reduce potential safety risks to acceptable levels. The controlled vehicle ramp would have a speed limit of 15 miles per hour, and would include speed control measures to ensure safety of individuals.

- The AC Transit bus storage facility parking is an existing facility that would be used by the general public for off-hours and nighttime or event parking when not in use by AC Transit for regular operations. Sound walls will surround the bus storage facility on three sides, and the fourth side along Stillman Street will be secured by fencing and will be under surveillance, as required. As a result, substantial security risks at this parking facility are not expected. There is nothing inherent in this proposed project component or its operation that would pose an unusual safety concern.

The proposed project would be jointly patrolled by the SFPD and private security forces. These patrols would be supplemented by video and security device monitoring staff, who would maintain communication with the patrols for the necessary coverage and response times. Accordingly, the other transportation improvements would not adversely affect passenger safety and would be less than significant.

Adjacent Land Development. The proposed adjacent land development would allow residential or commercial and office space to be constructed next to the proposed intercity bus facility and a mix of uses, consistent with City zoning, at either of the optional vent structure sites at Third Street and Townsend Street. There is nothing inherent in the land development above the intercity bus facility that would contribute to safety concerns. In fact, the presence of additional development around the bus area would increase informal surveillance of the intercity bus facility by building occupants, and could have the beneficial effect of deterring activities that could adversely affect passenger safety. The proposed adjacent land development at the preferred and alternate vent structure site at Third Street and Townsend Street would not be in proximity to the vehicles, stations, or parking lots and, thus, would have no indirect effect/impact on passenger safety.

Impact SS-3: The proposed project would not result in unacceptable potential security risks or threats. (No Adverse Effect/Less-than-Significant Impact)

The proposed project could change the DTX system's vulnerability to security risks or threats from that evaluated in the 2004 FEIS/EIR if it, among other things, provided new unsecured opportunities to access the system, introduced new unprotected above-ground facilities, or resulted in new large public gatherings. The TJPA would be required to prepare a Safety and Security Management Plan that complies with FTA Circular 5800.1 (August 1, 2007), which defines specific safety and security activities that a recipient of FTA funding must perform. This plan, in combination with other safety and security features required by the DTX Design Criteria, industry practices, and CPUC general orders, would reduce security threats to an acceptable level.

In addition, the Transbay Program, as approved, and the proposed project would be jointly patrolled by the SFPD and private security forces. These patrols would be supplemented by video and security device monitoring staff, who would maintain communication with patrols for the necessary coverage and response times. A daily deployment of SFPD and private security officers would perform scheduled patrols. Once construction is complete and the Transit Center and DTX are operational, it is assumed that, in addition to augmented monitoring capabilities, there would be additional daily SFPD and private security officers on patrol at the Transit Center. The TJPA would coordinate any security risk factors prior to final design of the proposed project with the SFPD, SFFD, California High-Speed Rail Authority, and Caltrain to help protect users and facilities.

Potential security risks or threats as a result of the proposed project components are described below.

DTX Refinements. The siting and design of the vent structures present possible security concerns. The vent shafts would be above-ground structures, accessible at street level. One vent structure at either the southeast or northeast corner of Third Street and Townsend Street would accommodate land development on the same parcel, and entry through the vent structures could allow access into the DTX, particularly the tunnel segment. Thus, this proposed project component could affect security if not carefully designed. The vent structures would have secure and restricted access because they are considered to be non-public areas according to the DTX Design Criteria. The number of access points to non-public areas would be minimized to simplify access control and security equipment requirements. The tunnel ventilation system and vent structures would be continuously monitored from a central control facility, and would be lighted for security. Vent structures would have perimeter fencing installed to provide security and ensure the safety of the general public and employees. In addition, minimum heights would be established for the intake and exhaust louvers on the sides of the vent shafts to ensure that smoke from a fire in the tunnel would disperse efficiently without disturbing neighboring land uses, but also to prevent unauthorized access to the vent structures. These design standards would reduce security risks and threats to acceptable levels.

None of the other proposed project components (i.e., the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, rock dowels, and additional trackwork south of the Caltrain railyard) would result in potential security risks or threats.

- The first two DTX refinements modify the area on either side of the train box, which is currently under construction. They would both be underground and would not create new unsecured entrances to the Transit Center or DTX system and high-speed operations. These components would not represent new areas of substantial population gatherings.

- The realigned Fourth and Townsend Street Station would adjust the orientation of this proposed underground station. This proposed project component would not create additional unsecured

entrances to the DTX facilities, would not alter the number of passengers that could use the system, and would not change the facility's risk compared to the earlier approved alignment and location.

- The tunnel stub box would be constructed during Phase 2, with its use occurring in the future when Caltrain and high-speed trains would be in use below ground. This proposed project component would be backfilled and sealed for later use. Therefore, the tunnel stub box would not provide access to the system.

- The rock dowels would be used during construction of the DTX tunnel and have no function related to the operation of the DTX or the proposed project.

- The additional trackwork south of the Caltrain railyard would be used to move trains between the Caltrain railyard and the Transbay Transit Center. No passengers would be on the trains during these movements. The movements would occur within the existing right-of-way along Seventh Street, already used for Caltrain service, and therefore this would not change the facility's risk compared to the current operations.

Therefore, none of these proposed project components described above would represent an increased security risk for the DTX and a no adverse effect/less-than-significant impact would occur.

Other Transportation Improvements. The proposed intercity bus facility would be an aboveground facility, with connections to allow transit passengers access to the DTX system via stairways and escalators, and would be a new public gathering area in proximity to the Transit Center. Based on these factors, this proposed project component could be a risk to the DTX if not designed properly. As described above for the vent structures, the facility would be evaluated in as design elements for this specific project component is further developed. TJPA Safety and Security Management Plan that complies with FTA Circular 5800.1. This plan, in combination with other safety and security features required by the DTX Design Criteria and industry practices, would incorporate measures to reduce vulnerability to security risks and threats. Security patrols, informal surveillance provided by the proposed development above the intercity bus facility, and lighting specifications would further minimize this potential effect.

The TJPA has taken potential security threat precautions by designing the taxi staging area at street level rather than having an underground taxi unloading and loading zone. The staging area would occur along Minna Street between First and Second Streets, along Natoma Street between Beale and Main Streets, and along Main Street between Natoma and Howard Streets. This design would prevent access to the lower levels of the Transit Center from below-grade loading areas.

The bicycle/controlled vehicle ramp would connect Howard Street to below-grade bicycle facilities in the Transit Center. Entrance into the Lower Concourse level would be controlled and subject to surveillance, like other areas of the Transit Center.

The AC Transit bus storage facility parking is an existing facility that would be used for off-hours and nighttime or event parking when not in use by AC Transit for regular operations. This proposed project component is not near the DTX facilities, and would not provide access to the DTX system. Accordingly, it would pose no security risk or threat to the system.

The BART/Muni underground pedestrian connector would connect the Transit Center to the Embarcadero BART/Muni Station on Market Street. As described under Section 3.16.2, Affected Environment, under "DTX Design Criteria," this facility would be constructed in accordance with Chapter 3 of the DTX

Design Criteria, which requires hazard and vulnerability analyses of DTX facilities, and specific measures to reduce security risks.

None of the other transportation improvements described above would result in unacceptable security risks in the proposed project area, and they would have a no adverse effect/less-than-significant impact.

Adjacent Land Development. The proposed adjacent land development would be located in a highly developed area surrounded by other residential and commercial buildings. As described in Impact SS-1 and Impact SS-2, there is nothing inherently risky about this proposed project component or its operations that would suggest that they pose any greater security risk than other development in the proposed project area. Therefore, this proposed project component would have a no indirect adverse effect/less-than-significant security impact.

Cumulative Analysis

Impact CU-SS-4: The proposed project, in combination with reasonably foreseeable development, could result in safety and security risks; however, the cumulative effect would not be adverse. (No Adverse Effect/Less-than-Significant Impact)

The geographic context of the cumulative safety and security impact analysis is defined as the area within the Transit Center District Plan (TCDP), and the Central SoMa, East SoMa, and Mission Bay North Plans, because safety and security threats are often targeted in a specific area and these area plans encompass the proposed project area. Although the proposed project would not result in a substantial increase for potential accidents, safety concerns, or security risks, other reasonably foreseeable projects in the City, in combination with the proposed project, could result in an unacceptable safety and security risk.

The TCDP provides for development directly around the Transit Center, focusing on both private properties and properties owned or to be owned by the TJPA around the Transit Center itself, extending toward Market Street. The development planned in the TCDP and other plan area could contribute to cumulative impacts on safety and security. The TJPA would work with City departments such as the SFPD and the Department of Emergency Management to ensure that emergency communication systems within new high-rise buildings are functional and appropriately designed. Such strategies may include police access to control systems, surveillance cameras and other technology, evacuation procedures and live drills, high-rise crime prevention through environmental design, disaster preparedness, access and egress points of identification, and private security offices, if appropriate. Coordination with the SFPD would also occur for such elements as close-circuit monitoring, wireless and mesh networks, perimeter security systems, access control systems, weapons and explosion detection systems, and anti-terrorism and blast mitigation systems and designs. These systems would be incorporated into the proposed project as recommended and required by regulations, to the extent practicable.

Development in the area around the DTX would be required to have safety and security measures to maximize the protection of the public from injury due to natural disaster, terrorist attack, sabotage, civil unrest or civil disturbances, accidents, and crime (City of San Francisco 2012b). Any current or foreseeable projects within the proposed project area would comply with any General Plan policies related to community safety, which would render safety and security impacts less than significant.

Furthermore, as discussed above, the proposed project area is currently served by the SFPD and SFFD. The City of San Francisco Department of Emergency Management is charged with preparing for routine emergencies and natural disasters within the City, including the proposed project area, and also manages Homeland Security priorities. The City's General Plan Community Safety Element establishes policies to

guide the City's actions in preparation for, response to, and recovery from major disasters, which the proposed project would comply with. Therefore, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a cumulatively significant impact, and there would be no cumulative adverse effect.

3.16.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Safety and Security (Not Adverse)	The 2004 FEIS/EIR concluded that the Transbay Program would reduce conflicts between buses/trains and pedestrians, except at the platform and bus loading areas. Therefore, the potential for accidents, such as train collisions and derailments, was not further addressed in the 2004 FEIS/EIR. The proposed project analyzed in this SEIS/EIR would not result in a substantial potential for accidents and would not result in substantial potential safety risks. In addition, the proposed project would not result in unacceptable potential security risks or security threats. Therefore, the proposed project would not result in any new adverse effects not identified in the 2004 FEIS/EIR or change the effects in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
CEQA Summary	
Impact SS-1: Potential for Accidents, such as Train Collisions and Derailments (Less than Significant)	The 2004 FEIS/EIR concluded that the Transbay Program would reduce conflicts between buses/trains and pedestrians. Therefore, the potential for accidents, such as train collisions and derailments, was not further addressed in the 2004 FEIS/EIR. The proposed project analyzed in this SEIS/EIR would not result in a substantial potential for accidents, and impacts would be less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact SS-2: Safety Risks for Individuals on Vehicles, at Stations, or in Parking Lots (Less than Significant)	The 2004 FEIS/EIR concluded that no substantial potential would exist for safety concerns and did not identify any significant safety risks. The proposed project analyzed in this SEIS/EIR would have a less-than-significant impact and would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact SS-3: Unacceptable Potential Security Risks or Threats (Less than Significant)	The 2004 FEIS/EIR concluded that a less-than-significant impact related to security would occur. The proposed project analyzed in this SEIS/EIR would not result in unacceptable potential security risks or security threats, and impacts would be less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact CU-SS-4: Cumulative Safety and Security Risks (Less than Significant)	The proposed project, in combination with other reasonably foreseeable development, would result in less-than-significant cumulative safety and security impacts. The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.

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3.17 UTILITIES

3.17.1 Introduction

This section provides a description of the utilities systems—which includes potable water, wastewater and stormwater, solid waste, and power lines—within the proposed project footprint. Additional information and analysis of the stormwater system are presented in Section 3.8, Water Resources and Water Quality. Key data sources consulted to provide an overview of the current systems include reports published by the San Francisco Public Utilities Commission (SFPUC) and the San Francisco Department of the Environment.

3.17.2 Affected Environment

Water

The SFPUC regional water system supplies water to 2.6 million residents and business in San Francisco, and 27 wholesale water agencies in Alameda, Santa Clara, and San Mateo Counties (SFPUC 2013a). The SFPUC supplies water from two sources, the Tuolumne River through the Hetch Hetchy reservoir, and local runoff into Bay Area reservoirs in the Alameda and Peninsula Watersheds.

The local water system provides distribution and storage for water and fire protection within the City. This system includes 10 reservoirs, eight water tanks, 18 pump stations, and approximately 1,250 miles of transmission lines and water mains within the City. The SFPUC manages distribution of potable water through two systems: a low-pressure water main system provides water for domestic and commercial uses at approximately 1,000 gallons per minute (gpm), and a high-pressure system provides a dedicated water source for fire suppression at approximately 10,000 gpm (SFPUC 2011a). From October 2012 through September 2013, San Francisco's average daily water use was approximately 71 million gallons per day (mgd) (SFPUC 2013a).

The SFPUC has undertaken the Water System Improvement Program (WSIP), a $4.6 billion program to upgrade the regional water system and provide long-term adequacy of the system, especially during droughts. As a part of the WSIP, the SFPUC has a goal of reducing demand for regional water system supplies by 10 mgd by 2018 by supplementing and diversifying the water supply through active conservation, increased water recycling, and local groundwater use. The SFPUC is currently implementing multiple programs and projects to achieve this goal.

Stormwater and Wastewater

The SFPUC maintains and operates the existing combined sewer system within the City. This system combines stormwater runoff and wastewater flows in the same network of pipes throughout the City, including the proposed project area. Stormwater and wastewater flow to the City's three treatment plants where it is treated prior to discharge through outfalls into the Bay or Pacific Ocean. Wastewater from the proposed project area is treated at the Southeast Treatment Plant in the Bayview district, with additional wet-weather capacity provided by the North Point Wet Weather Facility located near Fisherman's Wharf on the northeast waterfront. The Southeast Treatment Plant is responsible for treating approximately 80 percent of the City's wastewater flow, and the Oceanside Treatment Plant is responsible for treating the remaining 20 percent. The North Point Wet Weather Facility is only used during wet-weather events when the Southeast Treatment Plant approaches capacity. The Southeast Treatment Plant treats approximately 57 mgd of wastewater and 160 wet tons of biosolids each day (SFPUC 2013b).

Solid Waste

Solid waste generated in San Francisco is transported to the Altamont Landfill in Alameda County. In 2002, the City passed a resolution to adopt a goal of 75 percent landfill diversion by 2010 and a long-term goal of zero waste, and in 2003, passed a resolution that adopted 2020 as the new date for the City to achieve zero waste to landfills. The City has since achieved 78 percent diversion, sending 475,800 tons to landfills in 2009, and achieved 80 percent diversion, sending 444,000 tons to landfills in 2010 (San Francisco Department of the Environment 2014). As of March 2013, San Francisco's remaining landfill capacity at Altamont Landfill was approximately 1 million tons, with an original capacity of 15 million tons. At this current disposal rate, San Francisco's available landfill space under the existing contract will run out in January 2016 (San Francisco Department of the Environment 2014). In July 2011, the San Francisco Board of Supervisors approved a 10-year contract with Recology to ship the City's solid waste to the Ostrom Road Landfill in Yuba County when the current agreement with the Altamont Landfill expires.

Energy

Natural gas service in San Francisco is provided by Pacific Gas and Electric Company (PG&E). PG&E is also the energy provider for approximately 75 percent of the electric energy used in San Francisco. The SFPUC Power Enterprise serves all municipal facilities and selected other customers, providing approximately 17 percent of San Francisco's energy usage. The remaining 8 percent of energy is supplied by third-party energy providers that serve direct-access customers. In 2011, the total electricity usage in the City was approximately 6,000 gigawatt hours, and is forecast to grow at a rate of 1.3 percent per year to approximately 8,000 gigawatt hours per year by 2030 (SFPUC 2011b). Currently, 12-kilovolt electric distribution lines and 2-inch- and 3-inch-diameter high-pressure gas mains serve the Transbay Program project area.

The California Independent System Operator (ISO) is responsible for managing the flow of electricity along the state's open-market wholesale power grid. The California ISO forecasts that statewide energy consumption will increase 11.6 percent from 2008 to 2018, primarily because of growth in the residential and commercial sectors.

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning water, wastewater, stormwater, solid wastes, and energy management, use, and conservation, including new guidance issued since the 2004 FEIS/EIR.

State

CEQA (California PRC Section 21000 et seq.) and CEQA Guidelines (CCR, Title 14, Section 15000 et seq.)

CEQA and its implementing guidelines require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts on utilities and public services, and to avoid or mitigate those impacts when feasible.

California Fire Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which includes regulations concerning building standards (as set forth in Title 24 of the California Code of Regulations, the California Building Code), fire protection and notification systems, fire protection devices (such as fire extinguishers and smoke alarms), high-rise building standards, child care facility

standards, and fire suppression training. California Fire Code Section 507 specifically addresses requirements for water supply for fire protection for buildings, structures, and premises, and California Fire Code Section 3312.1 addresses the requirement of having an approved water supply for fire protection at construction and demolitions sites, if combustible materials are on-site.

California Integrated Waste Management Act (Assembly Bill 939)

The California Integrated Waste Management Act of 1989 established the California Integrated Waste Management Board (CIWMB); required the implementation of integrated waste management plans; and mandated that, beginning in 2000, local jurisdictions divert at least 50 percent of all solid waste, with 1990 as the baseline level, and by 2010 divert at least 75 percent of all solid waste. This has resulted in the City adopting Resolution Number 530-04 and Resolution Number 002-03 to meet this goal as part of the Zero Waste to Landfill Resolution, which is described below. CIWMB was renamed to CalRecycle in 2010.

Local

Domestic Water

San Francisco General Plan. The City's General Plan contains policies and implementation strategies related to water supply and distribution. The policies below are from the Community Facilities Element and Environmental Protection Element.

Community Facilities Element, Policy 1.6. Design facilities to allow for flexibility, future expansion, full operation in the event of a seismic emergency, and security and safety for personnel, while still maintaining an inviting appearance that is in scale with neighborhood development.

Environmental Protection Element, Policy 5.1. Maintain an adequate water distribution system within San Francisco.

Environmental Protection Element, Policy 5.2. Exercise controls over development to correspond to the capabilities of the water supply and distribution system.

Environmental Protection Element, Policy 6.1. Maintain a leak detection program to prevent the waste of fresh water.

Sanitary Sewer and Storm Drainage

San Francisco Plumbing Code, Section 306.2. This code section requires roofs, inner courts, vent shafts, light wells, or similar areas having rainwater drains to discharge directly into a building drain or sewer or to an approved alternate location based on approved geotechnical and engineering designs.

San Francisco Building Code, Section 1506.1. This code section requires all storm or casual water from roof areas that total more than 200 square feet to drain or be conveyed directly to the building drain or storm drain or to an approved alternate location based on approved geotechnical and engineering design. Such drainage cannot be directed to flow onto adjacent property or over public sidewalks. Building projections not exceeding 12 inches in width are exempt from drainage requirements without area limitations.

San Francisco Stormwater Management Ordinance (Ordinance Number 83-10). Ordinance Number 83-10 requires the development and maintenance of stormwater management controls for specified

activities that disturb 5,000 square feet or more of the ground surface, and are subject to building, planning, and subdivision approvals.

San Francisco Stormwater Design Guidelines. The SFPUC, the City, and the Port of San Francisco partnered to develop the San Francisco Stormwater Design Guidelines, published in November 2009. The guidelines require new development and redevelopment that disturb 5,000 square feet or more of the ground surface to manage stormwater on-site. A Stormwater Control Plan reviewed and stamped by a licensed landscape architect, architect, or engineer is required to be submitted and approved by the SFPUC and Port of San Francisco.

Solid Waste

San Francisco Construction and Demolition Debris Recovery Program (Ordinance Number 27-06). The City adopted this ordinance to create a mandatory program to maximize the recycling of mixed construction and demolition debris. The ordinance requires that mixed construction and demolition debris be transported off-site by a registered transporter and taken to a registered facility that can process and divert from landfills a minimum of 65 percent of the material generated from construction, demolition, and remodeling projects.

Zero Waste to Landfill Resolution. The Board of Supervisors adopted a goal of 75 percent landfill diversion by the year 2010 and a goal of zero waste by 2020 through Resolution Number 530-04 and Resolution Number 002-03, respectively.

San Francisco Mandatory Recycling and Composting Ordinance (Ordinance Number 100-09). The Board of Supervisors adopted the goal of zero waste by 2020. Therefore, in 2009, the board passed the Mandatory Recycling and Composting Ordinance, requiring residences, agencies, and businesses in San Francisco to separate their refuse into recyclables, compostables, and landfill trash, and participate in recycling and composting programs.

Energy

San Francisco Strategies to Address Greenhouse Gas Emissions. The Strategies to Address Greenhouse Gas Emissions identifies mandatory requirements and incentives. These include increases in the energy efficiency of new and existing buildings, installation of solar panels on building roofs, and implementation of a "green" building strategy. The strategy also identifies 42 specific regulations for new development to reduce a project's greenhouse gas (GHG) emissions.

San Francisco Green Building Code, Section 301. This code section requires that buildings in the City be designed to include the green building measures specified as mandatory under the California Green Building Standards Code.

San Francisco Climate Change Goals and Action Plan (Ordinance Number 81-08). The City adopted this ordinance that calls for the SFPUC, in coordination with the Department of the Environment, to develop a plan to achieve a fossil-fuel-free electricity supply for the City by 2030.

3.17.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The intent of this analysis is to determine whether the proposed project would do any of the following:

- exceed wastewater treatment requirements of the Regional Water Quality Control Board;

- require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts;
- require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts;
- require water from sources without sufficient supplies to serve the project from existing entitlements and resources, or result in new or expanded entitlements;
- result in a determination by the wastewater treatment provider that 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;
- be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;
- be in violation of federal, state, or local statutes or regulations related to solid waste; or
- require electricity and/or natural gas from sources without sufficient supplies to serve the project from existing entitlements and resources, or result in new or expanded entitlements.

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project as described in this SEIS/EIR would not be implemented, impacts on utilities will be the same as those presented in Section 5.12 Utilities (pages 5-81 to 5-83) of the 2004 FEIS/EIR and the subsequent addenda. A summary of those previously analyzed effects, plus Mitigation Measure Util 1, which was previously adopted and incorporated into the Transbay Program, is provided below. The full text of the mitigation measure is provided in Appendix C of this SEIS/EIR.

Water. The No Action Alternative will include increased development in the Transbay Redevelopment project area, and therefore will increase demand for potable water. However, the demand will not be in excess of the amount projected and provided for in the area, and the generated demand for water will be negligible in the context of the overall demand within San Francisco. No need will exist for major expansion of water facilities as a result of the No Action Alternative, and the 2004 FEIS/EIR concluded that a no adverse effect/less-than-significant impact on water supply will occur.

Stormwater and Wastewater. Impacts on stormwater and wastewater facilities were not specifically addressed in the 2004 FEIS/EIR, because the areas proposed for new development under the Transbay Program were determined to be nearly all paved. Therefore, future development areas will not substantially increase stormwater runoff into the combined sewer and stormwater system. The Southeast Treatment Plant that will treat wastewater generated from the Transbay Program has sufficient capacity to accommodate stormwater and wastewater flows of up to 250 mgd, annual average dry-weather wastewater flows of 65 to 70 mgd, and wet-weather flows of up to 150 mgd. Projected wastewater flows and improvements identified in the City's Sewer Master Plan indicate an ability to accommodate the combined stormwater and wastewater flows that will result from the Transbay Program.

The City's Eastern Neighborhoods Rezoning and Community Plans EIR (City of San Francisco 2008), which encompasses the entire Transbay Program area and surrounding areas to the south, examined the wastewater impacts associated with development in the City's eastern neighborhoods. The EIR identified

the Sewer Master Plan, described above, which is an interim 5-year capital improvement program to, among other things, reduce flood risk and upgrade treatment plants. Also, all discharges from the combined sewer system to the Bay are operated in compliance with the federal Clean Water Act and the State's Porter-Cologne Water Quality Control Act through the City's National Pollutant Discharge Elimination System permit. The Eastern Neighborhoods EIR determined that impacts on the City's combined sewer system will be less than significant. Therefore, the No Action Alternative, being a part of the Eastern Neighborhoods Area Plan, likewise will have a no adverse effect/less-than-significant impact on stormwater and wastewater facilities.

Solid Waste. The No Action Alternative will generate solid waste that could be adequately accommodated by existing landfills, and no new or expanded facilities will be required, as determined by the City's Solid Waste Management Program. Although no mitigation will be required, measures are recommended to achieve the 50 percent reduction goal specified in the California Integrated Solid Waste Management Act of 1989 (Assembly Bill 939). These measures will include using recycled construction materials, where feasible; encouraging recycling of construction and demolition materials; and creating and implementing a long-term waste management plan for comprehensive recycling of materials. Therefore, the 2004 FEIS/EIR concluded that a no adverse effect/less-than-significant impact on solid waste disposal will occur.

Energy. The No Action Alternative will include increased development in the Transbay Redevelopment project area, and therefore will increase demand for energy consumption. However, demand for electricity and natural gas will not be in excess of the amounts projected and provided for in the area. No need will exist for major expansion of power facilities as a result of the No Action Alternative, and the 2004 FEIS/EIR concluded that a no adverse effect/less-than-significant impact on energy supply will occur.

Construction. Construction of the Downtown Rail Extension (DTX) will require the relocation of utilities or their "support in place," particularly in segments where construction will occur as cut-and-cover. Utilities crossing the alignment typically will be supported in-place from the excavation cross-bracing, and large utility crossings (36-inch-diameter and larger) may require specially designed supporting structures. Longitudinally running utilities will be permanently relocated outside the excavation area or temporarily supported along the side of the excavation, then permanently relocated over the subway during street restoration. Fewer utilities will be affected by the tunneling portion of the DTX, which typically will be constructed beneath the utilities.

Major utilities that will be affected by the No Action Alternative are summarized below.

- Along Townsend Street: AT&T, Quest, MCI, and Verizon fiber-optic cables; City Department of Public Works Auxiliary Water Supply System lines (a high-pressured water supply network for fire suppression) and combined sewer system lines; and SFPUC water lines. The Fourth and Townsend Street Station and the U-wall will require relocation of water and combined sewer system utilities. In particular, major combined sewers that run perpendicular to Townsend Street along Fourth, Fifth, and Sixth Streets willbe interrupted. The wastewater that flows south will be diverted in a relocated sewer line that will extend west along Townsend Street, turn south at the western end of the Caltrain railyard, and then turn back east along Berry Street to connect to the existing outfall location.

- Second Street from Folsom to Howard Streets: AT&T, MCI, and ATS communication lines; City Department of Public Works Auxiliary Water Supply System and combined sewer system lines; PG&E electric and natural gas lines; and SFPUC water lines. Most of these lines will be protected in place.

The 2004 FEIS/EIR concluded that Mitigation Measure Util 1, below, will reduce potential impacts on utilities during construction. Therefore, a no adverse effect/less-than-significant impact on utilities will occur during construction, with implementation of the adopted mitigation measure.

- **Util 1 –** extensively plan and coordinate with the San Francisco Department of Public Works during future phases of design and construction.

Proposed Project

Impact UT-1: The proposed project would not require new or expanded water entitlements. (No Adverse Effect/Less-than-Significant Impact)

The proposed project would primarily consist of transportation-related improvements and/or facilities needed to support the Caltrain and HSR service and to enhance connectivity around the Transit Center. These proposed project components include the widened throat structure, extended train box, vent structures, tunnel stub box, rock dowels, additional trackwork south of the Caltrain railyard, taxi staging area, bicycle/controlled vehicle ramp, and BART/Muni underground pedestrian connector. These components would not be occupied and, thus, would not generate water demand, other than limited amounts that might be used for maintenance of the surface-level facilities. The realigned Fourth and Townsend Street Station would modify the siting of this station that was previously evaluated in the 2004 FEIS/EIR. The relocation of the station would not alter the water demand associated with this proposed project component. As a result, none of the above-mentioned proposed project components would result in a substantial increase in water demand that would require expansion of, or new entitlements for, water supply.

The AC Transit bus storage facility that was evaluated in the 2004 FEIS/EIR and approved in April 2004 would include restrooms for daytime use. Use of this facility for off-hours/nighttime or event parking as part of the proposed project would generate a small incremental increase in water demand from employee restroom use; however, this water demand would be negligible because of the limited hours of operation and the small number of employees that would be on-site to provide valet parking services. The intercity bus facility would include administrative facilities and/or restrooms that would likewise generate a relatively small demand for water. Water may also be needed at this facility for maintenance activities; however, the amount would be negligible compared to the water demand of the Transbay Program and to the overall City demand. These two proposed project components, therefore, would have negligible effects on water supply.

However, proposed project components include the potential for land development adjacent to the proposed transportation facilities. In these locations where adjacent land development would occur, a new demand for water supply also would occur:

- two floors of either office space or residential space (approximately 128 units), totaling 45,000 square feet, above the proposed intercity bus facility; and

- mixed-use development totaling 76,000 square feet adjacent to the vent structure site at 701 Third Street, consisting of a 4,000-square-foot restaurant and either 72,000 square feet of office or residential (72 units), or approximately 72,000 square feet of mixed-use general commercial, manufacturing, home and business service, live/work use, arts uses, light industrial activities, and small design professional office firms adjacent to the alternate vent structure site at 699 Third Street and 180 Townsend Street.

The site of the proposed intercity bus facility and adjacent land development was previously evaluated in the 2004 FEIS/EIR for office and retail uses and, thus, the No Action Alternative already included

approved development and associated water demands at this location. In particular, the approved Transbay Program included 848,435 square feet of office and retail space for the block with the proposed intercity bus facility (of which an estimated 755,000 square feet would be developed at the site just south of the intercity bus facility, leaving 93,435 square feet of approved but unspecified development). Because a greater amount of development was approved at this site than is anticipated under the proposed project, and because the 2004 FEIS/EIR concluded that no adverse effect on water supply would occur, the proposed project components at this site likewise would not increase water demand so that new water entitlements or infrastructure would be needed.

Using data derived from the SFPUC's 2011 Retail Demand Model Update and Calibration (SFPUC 2011b), and the Santa Clara Valley Water District's Water Use and Conservation Baseline Study (Santa Clara Valley Water District 2008), future development at the intercity bus facility and the 701 Third Street vent structure sites was projected to generate additional water demand of approximately 17,787 gallons per day (gpd). Because the 2004 FEIS/EIR already included water demand for some type of development at the intercity bus facility, the net increase in water demand from the proposed project is only that associated with the future development at the 701 Third Street vent structure site, or approximately 11,200 gpd, assuming restaurant and office space that would conservatively yield the greatest water consumption. This estimated water demand was not reduced by the amount of the water currently consumed by the fast-food restaurant that would no longer be used, and is, therefore, conservative. Taking this into account plus the available water supply, this proposed project component would not result in an expansion of the water supply system or a need to increase entitlements for water supply. The potential land development at the alternate vent structure location would result in a water demand similar to that estimated for the 701 Third Street site, since the number of square feet of development and the types of uses at the alternate site would be comparable.

The SFPUC's Urban Water Management Plan (UWMP) assesses future water demand using year 2035 growth projections prepared by the City Planning Department and the Association of Bay Area Governments (SFPUC 2011a). In 2011, the SFPUC adopted a resolution finding that the UWMP adequately fulfills the requirements of the water assessment for urban water suppliers. The UWMP determines how the City will meet future water demand based on projected future development within the City. The UWMP uses year 2035 growth projections, and the adjacent development that could occur as part of the proposed project falls within this growth projection. Therefore, the UWMP accounts for the proposed project in its water demand forecasts and has determined that water demand would be satisfied. Because the proposed project is within the demand projections of the UWMP, the proposed project would not exceed the City's available water supply and the proposed project would result in a no adverse indirect effect/less-than-significant impact.

Impact UT-2: The project would not require the construction of new wastewater treatment facilities, exceed the capacity of the wastewater treatment provider, or exceed wastewater treatment requirements of the RWQCB. (No Adverse Effect/Less-than-Significant Impact)

Future adjacent land development associated with the proposed project would generate wastewater. Use of the intercity bus facility and AC Transit bus storage facility parking would also increase wastewater demand. None of the other transportation-related proposed project components would result in wastewater generation, although negligible amounts of water used for maintenance could drain into the City's combined sewer and stormwater system. Conservatively assuming that 90 percent of water used would become wastewater, the proposed project would result in approximately 16,008 gpd of wastewater. This estimate includes the adjacent land development at the intercity bus facility site that was previously evaluated for retail and office uses in the 2004 FEIS/EIR and already assumed as part of the No Action Alternative. Therefore, the net increase in wastewater generation would only be that associated with the future development at the 701 Third Street vent structure site. The additional wastewater generation

associated with the future mixed uses at this site, assuming restaurant and office space that would conservatively yield the greatest wastewater generation, would be approximately 10,100 gpd, without subtracting the existing wastewater generated by the fast-food restaurant that would be displaced. Wastewater generation from land development at the alternate vent structure site would be similar to that estimated for the 701 Third Street site, because of the similarity in the amount and type of development that could occur.

The Southeast Treatment Plant, which serves the proposed project area, treats approximately 57 mgd of wastewater and 160 wet tons of biosolids each day. During wet conditions, it has the capacity to treat 250 mgd of wastewater. The increase of 16,008 gpd of wastewater generated by the proposed project would not exceed the capacity of the Southeast Treatment Plant. The plant is currently in compliance with the Regional Water Quality Control Board's (RWQCB) wastewater treatment requirements, and would continue to be in compliance after implementation of the proposed project because the additional wastewater flow would not exceed the treatment plant's capacity. In addition, the wastewater constituents from the adjacent land development would be typical of residential and commercial effluent and would not require more stringent treatment than occurs now. The proposed project would, therefore, not require the construction of new wastewater treatment facilities to treat wastewater generated by the project, and would not exceed wastewater treatment requirements of the RWQCB. The proposed project would result in a no adverse indirect effect/less-than-significant impact.

Impact UT-3: The proposed project could require the construction or expansion of stormwater drainage facilities but would be consistent with existing City requirements and the DTX Design Criteria. (No Adverse Effect/Less-than-Significant Impact)

The proposed project area is located within a heavily urbanized area that is currently served by stormwater drainage facilities (SFPUC 2013c). Stormwater in the proposed project area would discharge to the City's combined stormwater/sewer system. A number of the proposed project components would be located underground and, therefore, would not contribute surface runoff to the stormwater drainage system. These components include the widened throat structure, extended train box, realigned Fourth and Townsend Street Station, tunnel stub box, rock dowels, and the BART/Muni underground pedestrian connector. Other proposed project components—additional trackwork south of the Caltrain railyard, the taxi staging area, and AC Transit bus storage facility parking—would use existing paved areas with existing stormwater drainage facilities in place. As a result, these DTX refinements and other transportation improvements would have no effect on stormwater drainage facilities.

Proposed project components that support or expand improvements already approved as part of the Transbay Program Phase 2—the bicycle/controlled vehicle ramp and the vent structures—would be constructed on sites that are already impervious and, thus, would not increase stormwater runoff volumes. They would also tie into the existing stormwater drainage infrastructure. Therefore, these proposed project components would not require the construction of new stormwater drainage facilities. Also, because they affect sites that are already paved or are largely impervious, the resulting stormwater runoff would not be expected to require an expansion of stormwater drainage facilities.

The remaining two proposed project components—the intercity bus facility and the adjacent land development—would involve new construction that would require new on-site drainage facilities that would tie into the City's existing combined sewer and stormwater system. The intercity bus facility would occupy a relatively large site (an estimated 43,400 square feet) that is currently used for construction staging, offices, parking, and landscaping. With redevelopment of the site for the intercity bus facility and its paved surfaces for bus ingress and egress, it is expected that stormwater runoff volumes would increase over existing levels, but by an insubstantial amount, because the increase in impervious surface would be minimal and the design would need to comply with the City's stormwater management

ordinance and stormwater design guidelines. The sites of the two adjacent land developments, approximately 13,750 square feet and 45,000 square feet, are currently completely paved. These sites may require on-site stormwater controls to accommodate new, more intensive development; however, development of these sites as part of the proposed project would not result in the need for new or expanded drainage facilities to convey stormwater to the wastewater treatment plant. As discussed in Section 3.8, Water Resources and Water Quality, the additional increment of stormwater runoff from these sites, compared to existing conditions, would be minimal and would not be expected to exceed the capacity of the existing systems.

Design of on-site stormwater management controls to connect to existing infrastructure would comply with the DTX Design Criteria, which specifies conformance with SFPUC and City Department of Public Works requirements for stormwater management. Design of the proposed project would also satisfy the City's stormwater management ordinance and stormwater design guidelines, which call for management of stormwater on-site to reduce stormwater runoff rates and volume into the City's combined sewer and stormwater system. Therefore, the proposed project would result in a no adverse effect/less than significant impact related to stormwater drainage facilities.

Impact UT-4: The project would generate solid waste disposal needs, but the demand could be accommodated by the landfill serving the project area. (No Adverse Effect/Less-than-Significant Impact)

The proposed project includes primarily transportation-related improvements and/or facilities needed to support the DTX and high-speed train service and to enhance connectivity around the Transit Center. These components include the widened throat structure, extended train box, vent structures, tunnel stub box, rock dowels, additional trackwork south of the Caltrain railyard, intercity bus facility, taxi staging area, bicycle/controlled vehicle ramp, AC Transit bus storage facility parking, and BART/Muni underground pedestrian connector. These proposed project components would not be occupied and would not generate any solid waste. The realigned Fourth and Townsend Street Station would modify the siting of this station from what was previously evaluated in the 2004 FEIS/EIR. The relocation of the station would not alter the solid waste generation associated with this proposed project component. Therefore, the above-mentioned proposed project components would have no effect on demand for the City's landfill.

However, components exist where land development could occur adjacent to the proposed transportation facilities that would increase the demand for solid waste disposal and landfill capacity. As described in Impact UT-1, one of the two proposed future development sites was previously evaluated and environmentally cleared in the 2004 FEIS/EIR. Because a greater amount of development was evaluated in the 2004 FEIS/EIR at this site than is anticipated under the proposed project, and the 2004 FEIS/EIR concluded that an adequate landfill capacity would exist to serve the Transbay Program, the adjacent land development at the intercity bus facility would not increase solid waste demand such that additional landfill capacity would be needed. The second site where adjacent land development could occur is at either of the optional vent structure sites at Third and Townsend Streets. The most floor area that would be expected at either of these sites, based on City zoning, is 76,000 square feet that could generate up to approximately 300 employees (see Table 3.4.16 in Section 3.4, Socioeconomics, Population, and Housing). Assuming that these employees generate solid waste at the same rate as the citywide per-capita rate of approximately 3.7 pounds per day, accounting for all sources of solid waste, the solid waste from this development would total approximately 1,120 pounds per day. By comparison, the City sends 1,800 tons per day of solid waste to landfills (GAIA 2012). Accordingly, the proposed project would not have a significant impact on landfill capacity because of the relatively minor amount of additional solid waste that the proposed project uses would produce, the City's aggressive programs to achieve zero waste, and the availability of additional landfill capacity at the Yuba County Landfill. In addition, the San Francisco

Department of Environment predicts a flat rate of solid waste generation through 2030 based on current and projected economic conditions. This projection is largely based on the San Francisco Zero Waste to Landfill Resolution, which would require that the waste generated by the future adjacent development associated with the proposed project would not result in a significant impact or an adverse indirect effect on landfill capacity.

Solid waste generated during construction of the proposed project would temporarily increase the demand for solid waste disposal and landfill capacity. The proposed project would comply with the San Francisco Construction and Demolition Debris Recovery Program, which requires that mixed construction and demolition debris be transported off-site by a registered transporter and taken to a registered facility that can process and divert from landfills a minimum of 65 percent of the material generated from construction, demolition, and remodeling projects. Thus, the proposed project would result in a no adverse effect/less-than-significant impact on landfill capacity or solid waste disposal needs.

Impact UT-5: The proposed project would comply with federal, state, and local statutes and regulations related to solid waste. (No Effect/No Impact)

As discussed above under Impact UT-4, the proposed project would be subject to San Francisco's Zero Waste to Landfill Resolution, which adopted a goal of 75 percent landfill diversion by the year 2010, and zero waste by 2020, through Resolution Number 530-04 and Resolution Number 002-03, respectively. The proposed project would also be subject to the San Francisco Construction and Demolition Debris Recovery Program (Ordinance Number 27-06), which requires that 65 percent of mixed construction and demolition waste be diverted from landfills. Construction waste and non-hazardous debris would be hauled off-site during construction. The proposed project would comply with all pertinent federal, state, and local requirements regarding solid waste, and no effect/no impact would occur.

Impact UT-6: The proposed project would not require new or expanded electricity and/or natural gas entitlements. (No Adverse Effect/Less-than-Significant Impact)

As discussed under Impact UT-1, the proposed project would, among other things, modify the train box and advance construction of other rail-related infrastructure to comply with CHSRA design specifications and accommodate both Caltrain and high-speed train services. Several proposed project components, such as the tunnel stub box, rock dowels, and additional trackwork south of the Caltrain railyard would not result in any increased energy demand following completion of construction, and would have no effect on energy demand or supplies.

Other transportation-related proposed project components would require power to operate. These proposed project components are the widened throat structure, extended train box, vent structure, intercity bus facility, bicycle/controlled vehicle ramp, AC Transit bus storage facility parking, and the BART/Muni underground pedestrian connector. The throat structure, vent structures, and AC Transit bus storage facility were all previously evaluated as part of the No Action Alternative, and the changes included as part of the proposed project would not substantially modify or increase their energy usage. All of these proposed project components would require lighting for safety and security. The vent structures would also require fans and emergency generators; the BART/Muni underground pedestrian connector would possibly also include a moving sidewalk; and the adjacent land development would also require energy for heating, ventilation, and operation of household and office appliances. The DTX Design Criteria specifies that the California Building Code and the National Electric Code would govern design and operation of transportation-related facilities. None of these components, however, involve energy consumption that could not be met by PG&E and the SFPUC's Power Enterprise. As a result, these proposed project components would increase energy demand but would not require new or expanded energy supplies.

The proposed project would also include adjacent land development at two of the proposed project component sites. However, as described in Impact UT-1, the proposed future development at the intercity bus facility was previously evaluated and environmentally cleared in the 2004 FEIS/EIR. Because a greater amount of development was evaluated at this site than is anticipated under the proposed project, and the 2004 FEIS/EIR concluded that no adverse effect on utilities would occur, the proposed adjacent land development at this site would likewise not increase energy demand so that new electrical or natural gas capacity or supplies would be needed.

The second adjacent land development site, at 701 Third Street or the alternate site at 699 Third Street and 180 Townsend Street, was not previously analyzed under the 2004 FEIS/EIR. Development at either of these locations would result in a net increase in demand for electric and natural gas service over existing uses; however, the proposed project would comply with San Francisco Green Building Code, Section 301; San Francisco Strategies to Address Greenhouse Gas Emissions; and all other applicable green building code standards to decrease energy consumption. Therefore, the proposed project would result in a no adverse effect/less-than-significant impact on energy resources because it would not increase energy demand such that new electrical or natural gas capacity or supplies would be needed.

Impact C-UT-7: The proposed project would not adversely affect underground utilities during construction that could result in possible disruption of service to customers. (No Adverse Effect/Less-than-Significant Impact)

The proposed trackwork south of the Caltrain railyard, intercity bus facility, the taxi staging area around the Transit Center, and the proposed AC Transit bus storage parking area would involve principally at-grade construction or pavement modifications. Construction of these proposed project components would not have the potential to interfere with below-grade utilities. All of the other proposed project components involve underground construction activities that could affect existing underground utilities. These proposed project components could interrupt utility services to residences and businesses in the proposed project area, as described below.

- The throat structure, which is a part of the Transbay Program that was previously evaluated in the 2004 FEIS/EIR, would be widened and shifted to the east as part of the proposed project. Utilities were already identified as being affected by the No Action Alternative and would be temporarily relocated or suspended in place during construction of the widened throat structure where the track has more than 20 feet vertical clearance from the upper outer edge of the concrete walls to existing ground. Widening of the throat structure as part of the proposed project would affect the same utilities as described for the No Action Alternative and would require the same temporary relocation or suspension in place.

- The extended train box would have an approximate excavation depth of 55 feet and could affect utilities, primarily under Main Street. The extended train box would be constructed using cut-and-cover techniques and would be at a depth beneath the utilities. Accordingly, these utilities may be temporarily relocated or suspended in place during construction.

- The underground Fourth and Townsend Street Station, which is a part of the Transbay Program that was previously evaluated in the 2004 FEIS/EIR, would be realigned and shifted to the north to be within the Townsend Street right-of-way as part of the proposed project. Utilities were already identified as being affected by the No Action Alternative and would be temporarily relocated, suspended in place, or relocated. In particular, the electric, gas, combined stormwater and sewer, and water lines would be relocated into a new utility corridor. The realigned Fourth and Townsend Street Station would affect the same utilities as previously identified and would require the same measures.

- Two of the vent structures, at Second and Harrison Streets and at Third Street and Townsend Street, would have a depth of excavation of approximately 60 to 100 feet. These sites are not in the public right-of-way and would not be expected to affect the major utility lines that are within the street right-of-ways that adjoin the sites. However, on-site utilities still may be either temporarily or permanently relocated, in compliance with City requirements.

- The tunnel stub box would be constructed below-grade, approximately 45 feet wide and up to 45 feet at its greatest depth below the ground surface at the west end of the Caltrain railyard. This proposed project component would generally follow the alignment of the previously environmentally cleared U-wall, although at a greater depth. Construction of the U-wall would require permanent relocation of the all utilities within the envelope or footprint of this project component. Construction of the tunnel stub box would involve excavation to a greater depth and a larger footprint than the U-wall (additional area between the U-wall northern boundary and Townsend Street). Accordingly, additional utility relocation associated with the tunnel stub box may occur beyond that previously anticipated for the U-wall.

- The rock dowels would be installed to support the mined tunnel from the Townsend Street curvature and along Second Street and would not affect utilities because they would be at depths far beneath the utilities.

- The bicycle and controlled vehicle ramp includes below-grade bicycle facilities that would be located within the footprint of the previously approved Phase 2 DTX project. Utility relocations associated with the train box were previously environmentally cleared in the 2004 FEIS/EIR and subsequent addenda. The ramp itself would extend approximately 120 feet north of Howard Street toward the Lower Concourse of the train box. This stretch between Howard and Natoma Streets would not be expected to require utility relocations or affect service to customers, since this area is being used by the TJPA as a staging area for Phase 1 construction.

- For the BART/Muni underground pedestrian connector under Beale Street to the Embarcadero Station on Market Street, all utilities are expected to be secured in place during the cut-and-cover excavation. As a result, service interruptions would not be expected.

In summary, construction of the proposed project components may interrupt utility service. Therefore, utility relocations, both temporary and permanent, could result in a potentially significant impact if service for customers were interrupted. Mitigation Measure Util 1, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project, would apply and would be implemented as part of the proposed project, thus avoiding the adverse effect and the potentially significant impact that would otherwise occur. Cumulative Analysis

Impact CU-UT-8: The proposed project, in combination with reasonably foreseeable development, would increase the demand on utilities; however, the cumulative impact would not be significant. (No Adverse Effect/Less-than-Significant Impact)

The geographic context of the cumulative utilities impact analysis is the City, mainly because the demand for and the supply of basic infrastructure to residents and businesses are provided on a citywide basis. The specific area around the proposed project encompasses the Transbay Program; Transit Center District Plan (TCDP); and Central SoMa, East SoMa, and Mission Bay North Plans, which may include connected elements that could have a cumulative impact. The proposed project would increase demand on utilities within the proposed project area. Although the utility demand from the proposed project would not be substantial, as presented in Impact UT-1 through Impact UT-6, and has been determined to be no adverse effect/ less-than-significant impact, other reasonably foreseeable projects in the City, in

combination with the proposed project, could result in an impact on demand that could be substantial. The growth projections shown in Section 3.1, Introduction and Table 3.1-1 identify a substantial amount of new development that would increase water, combined sewer system, solid waste, and energy needs in the project area and in the City.

Water. As described in the analysis above (Impact UT-1), the City in general and the proposed project area specifically have sufficient water facilities and capacity. The proposed project is not anticipated to significantly increase demand for water supplies.

The 2010 UWMP provides a cumulative assessment of the future growth in the City through 2035. According to the UWMP, the SFPUC would continue to meet the current and future demand in years of average or above-average precipitation. During a multiple dry-year event, however, water supplies would be insufficient to satisfy the projected water demand without augmenting the water supply or imposing additional water conservation measures. Given this potential shortfall, the SFPUC adopted the Water Shortage Allocation Plan, which describes steps for allocating SFPUC's water during system-wide shortages up to 20 percent. The SFPUC concluded that under the Water Shortage Allocation Plan, and with additional local WSIP supplies, sufficient water is available to meet existing demand and planned future uses within San Francisco (SFPUC 2011a).

Additionally, the SFPUC has in place several recycled water projects that use recycled water instead of drinking water for landscape irrigation, further reducing the demand on drinking water resources. The SFPUC is also proposing to build six deep groundwater wells to pump water from the Westside groundwater basin to provide another source of potable water to the City. In partnership with four other Bay Area agencies, the SFPUC is also studying the development of a potential desalination facility. With these steps, the SFPUC would ensure adequate future water supply for the City. Furthermore, building code requirements for water conservation and wastewater management would apply to the proposed project and any other reasonable foreseeable projects in the area. Given the City's procedures and plans, future citywide water demand would be met, and cumulative impacts on water demand would be not adverse/less than significant.

Wastewater/Stormwater. The wastewater treatment facility that serves the proposed project area and much of the eastern portion of the City is the Southeast Water Pollution Control Plant, which has an average dry-weather flow capacity of 84.5 mgd. Current flows amount to 67 mgd, allowing for substantial increases in wastewater flows. Nevertheless, the system is aging, and because it also combines to convey stormwater, wet-weather flows are several times greater than the average dry-weather flows and place additional demands on the system. As a result, in 2010, the SFPUC completed the Sewer System Master Plan aimed at establishing a long-term strategy to address the City's wastewater and stormwater needs. Because of the available capacity in the wastewater treatment plant, the City's program for improvements, and its funding of initial projects already, the combined wastewater/stormwater system is sufficient to serve projected needs over the foreseeable future. The TCDP, which was adopted by the City in 2012 and evaluated in the Transit Center District Plan and Transit Tower EIR, encompasses much of the land in the proposed project area around the Transit Center. Wastewater and stormwater associated with future growth under the TCDP would be conveyed to the Southeast Water Pollution Control Plant. Because the TCDP is current, its consideration of future wastewater and stormwater cumulative effects is relevant for the proposed project. The environmental review for the TCDP found that because no shortfall in wastewater treatment capacity would occur, no cumulative wastewater or stormwater impacts would occur because of the TCDP (City of San Francisco 2012). Accordingly, the cumulative wastewater and stormwater impacts would be not adverse/less than significant.

Solid Waste. The City adopted a goal of 75 percent landfill diversion by the year 2010, and zero waste by 2020, through Resolution Number 530-04 and Resolution Number 002-03, respectively. In addition to

these resolutions, the City adopted a number of ordinances aimed at reducing waste, such as the Extended Bag Reduction Ordinance, which requires the use of compostable plastic, recyclable paper, and/or reusable checkout bags by all retail establishments starting October 1, 2012, and requires these establishments to charge a minimum of ten cents per bag provided by the store. The proposed project, along with any foreseeable projects within in the City, would be subject to these local regulations to reduce solid waste; therefore, the cumulative solid waste impacts would be not adverse/less than significant.

Energy. PG&E is the primary service provider for electricity and natural gas in the City. Regular updates to its demand forecasts combined with the California ISO role in managing the flow of electricity along the state's open market wholesale power grid provide the means to meeting cumulative energy supplies. PG&E is responsible for coordinating with new development to meet the required natural gas and electrical service demands. Locally, the City has taken major steps to improve energy conservation and reduce demand for electricity generation, transmission, and distribution facilities. In Ordinance 81-08, the City endorsed a goal for the City to have a GHG-free electric system by 2030. The 2011 update to San Francisco's 2002 Electricity Resource Plan identifies strategies that San Francisco could take to have a GHG-free electric system by 2030, generating all of its energy needs from renewable and zero-GHG electric energy sources (SFPUC 2011c). In addition, the San Francisco Strategies to Address Greenhouse Gas Emissions identifies mandatory requirements and incentives to increase the energy efficiency of new and existing buildings in the City. The strategy also identifies 42 specific regulations for new development that would reduce a project's GHG emissions and thereby energy consumption. San Francisco Green Building Code, Section 301, requires that buildings in the City include the green building measures mandated under the California Green Building Standards Code. The proposed project, along with foreseeable projects within the City, would be subject to these local ordinances and regulations related to energy efficiencies. Consequently, although energy demand would increase with the proposed project in combination with foreseeable development, the cumulative energy demand would be not adverse/less than significant.

3.17.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Utilities (Not Adverse)	The 2004 FEIS/EIR concluded that with implementation of Mitigation Measure Util 1 there will be no impacts on utilities during construction. The proposed project analyzed in this SEIS/EIR would not require new or expanded water, wastewater, stormwater drainage, solid waste, or energy facilities. In addition, with implementation of mitigation adopted as part of the 2004 FEIS/EIR, construction-related effects to underground utilities would not be adverse. Therefore, the proposed project would not result in any new adverse effects not identified in the 2004 FEIS/EIR or change the effects determinations in the 2004 FEIS/EIR. No additional mitigation measures beyond Mitigation Measure Util 1 adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program would be required for the proposed project.
CEQA Summary	
Impact UT-1: Water Entitlements (Less than Significant)	The 2004 FEIS/EIR concluded that a less-than-significant impact on water supply would occur because, although an increased demand for potable water would occur, the increased demand for water would be negligible. Similarly, the proposed project analyzed in this SEIS/EIR would increase water demand but would not require new or expanded water entitlements, and the proposed project would result in less-than-significant impacts related to water demand. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.

Impact UT-2: Wastewater Treatment (Less than Significant)	Impacts on wastewater facilities were not specifically addressed in the 2004 FEIS/EIR because existing facilities would be able to accommodate the combined stormwater and wastewater flows that would result from the Transbay Program. Although the proposed project analyzed in this SEIS/EIR would increase the amount of wastewater flow, it would not require the construction of new wastewater treatment facilities or exceed the wastewater treatment requirements of the RWQCB, and the impacts would be less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact UT-3: Stormwater Drainage (Less than Significant)	Impacts on stormwater facilities were not identified in the 2004 FEIS/EIR because existing facilities would be able to accommodate the combined stormwater and wastewater flows that would result from the Transbay Program. The proposed project analyzed in this SEIS/EIR would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts. Thus, the impacts would be less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact UT-4: Solid Waste Disposal (Less than Significant)	The 2004 FEIS/EIR concluded that the project would not affect solid waste services because the amount of waste generated from the project would be less than 1 percent of the total citywide waste stream, and construction debris could be accommodated within existing landfills. The proposed project analyzed in this SEIS/EIR would generate solid waste but the waste generated could be accommodated by existing landfill capacity, which would be a less-than-significant impact. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact UT-5: Comply with Statutes and Regulations Related to Solid Waste (No Impact)	The 2004 FEIS/EIR did not specifically address compliance with regulations related to solid waste but did include waste reduction measures and stated that compliance with City and County ordinances regarding minimization of waste through recycling would be required. The proposed project analyzed in this SEIS/EIR would comply with federal, state, and local statutes and regulations related to solid waste, and no impact would occur. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact UT-6: Electricity and Natural Gas (Less than Significant)	The 2004 FEIS/EIR concluded that a less-than-significant impact on energy supply would occur because project-generated demand for electricity would be negligible and would not require a major expansion of power facilities. Similarly, although the proposed project analyzed in this SEIS/EIR would increase energy demand, it would not require new or expanded energy entitlements, and impacts would be less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No mitigation measures were included in the 2004 FEIS/EIR, and no mitigation measures would be required for the proposed project.
Impact C-UT-7: Construction – Underground Utilities Service (Less than Significant)	The 2004 FEIS/EIR concluded that construction would require the relocation of utilities or their "support in place." Mitigation Measure Util 1 would reduce potential construction impacts to less than significant. The proposed project analyzed in this SEIS/EIR would have a potentially significant impact on existing underground utilities during construction. Mitigation previously adopted in the 2004 FEIS/EIR and incorporated into the Transbay Program would apply and would reduce potential impacts to less than significant. Therefore, the proposed project would not result in any new significant impacts not identified in the 2004 FEIS/EIR or change the significance conclusions in the 2004 FEIS/EIR. No additional mitigation measures beyond Mitigation Measure Util 1 would be required for the proposed project.
Impact CU-UT-8: Cumulative Utility Impacts (Less than Significant)	The proposed project in combination with other reasonably foreseeable development would result in less-than-significant cumulative utilities impacts. The proposed project would not change the cumulative significance conclusion in the 2004 FEIS/EIR.

3.18 ENVIRONMENTAL JUSTICE COMMUNITIES

3.18.1 Introduction

This section reviews the socioeconomic characteristics of residents in the proposed project area to determine whether a high percentage of ethnic minority or low-income exists among residents in the vicinity of the proposed project. These populations are afforded particular consideration pursuant to Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Specifically, federal actions must be assessed for disproportionately high and adverse effects on low-income and minority populations. The analysis of the cultural, social, health, and environmental effects that these populations may sustain relative to the rest of society is referred to as "environmental justice." The purpose of an analysis of environmental justice issues is to better ensure equity for these populations when an action or program could create cultural, social, health, and/or environmental effects. "Equity" in this document means that particular groups would not bear a disproportionate burden of environmental and health consequences of an action relative to potential benefits. In particular, this analysis focuses on proposed project component locations and whether environmental justice effects are present and/or if conditions have changed since approval of the 2004 FEIS/EIR. Preparation of this environmental justice analysis is guided by FTA Circular 4703.1, "Environmental Justice Policy Guidance for Federal Transit Administration Recipients," issued on August 15, 2012 (FTA 2012) and U.S. Department of Transportation Order 5610.2(a), "Actions to Address Environmental Justice in Minority Populations and Low Income Populations," 77 FR 27534, issued May 10, 2012 (DOT 2012).

3.18.2 Affected Environment

Study Area Neighborhoods

The City's San Francisco Neighborhoods – Socio-Economic Profiles (2012) was reviewed to identify defined or established communities in the study area. Two communities were identified that encompass the project area: the Financial District and the SoMa neighborhood. The Financial District combines the Transit Center area with the City's financial core. This area contains relatively little population, given its concentration of businesses. Based on 2012 data, in the Financial District, 61 percent of the population is non-White and 30 percent of the population is below the poverty line. The SoMa neighborhood extends from the waterfront on the east to just past Eleventh Street on the west, between Market Street on the north and King Street on the south. This diverse neighborhood is 52 percent non-White and 20 percent of the population is below the poverty line.

Given the size, diversity, and multitude of smaller neighborhoods, in part defined by the many area plans within the Financial District and SoMa neighborhoods (see Figure 3.3-4 in Section 3.3, Land Use and Planning, Wind and Shadow, of this SEIS/EIR), this analysis refined the geographic study area for the environmental justice analysis. The presence of environmental justice populations was further determined through U.S. Census research and communication with local organizations and agencies, as described further below.

Definition of Environmental Justice Population/Community

This environmental justice analysis was prepared in accordance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994). The methodology follows the Federal Transit Administration Circular (FTA 2012) and the U.S. Department of Transportation Order 5610.2(a) (DOT 2012) on environmental justice assessments. The CEQ guidance for environmental justice analysis under NEPA (1997) was also referenced for guidance.

Ethnic and racial minority, and low income population groups in the study area are identified in this document using 2010 U.S. Census data and 2012 5-year estimates from the American Community Survey that describe racial and income characteristics.

As defined in Executive Order 12898, the term "minority" includes any individual who is an American Indian or Alaskan Native, Asian or Pacific Islander (including Native Hawaiian), Black/African American (not of Hispanic origin), or Hispanic/Latino. The term "low-income" is defined in accordance with Executive Order 12898 and agency guidance as a person with household income at or below the U.S. Department of Health and Human Services poverty guidelines. As defined in the CEQ guidance for environmental justice analysis under NEPA (1997), minority and/or low-income populations are identified when the minority or low-income population of the affected area exceeds 50 percent, or the minority or low-income population percentage of the affected area is meaningfully greater than the minority or low-income population percentage in the general population. Consistent with other planning documents for transportation projects in the City and County of San Francisco,[1] "meaningfully greater" is assumed to be at least 10 percentage points greater than the citywide percentages of minority or low-income populations. The minority and low-income populations within the study area, as defined below, were compared to the City as a whole to determine whether environmental justice populations exist in the study area.

Study Area for Environmental Justice

For purposes of this analysis, the study area is defined to include all census tract block groups within 0.25 mile[2] of each of the proposed project components. If any part of a census tract block group intersects the study area, it is included in this analysis. Data for the entire census tract block groups are analyzed to be more inclusive and, thus, conservative in identifying the potential impact on environmental justice communities in the vicinity of the proposed project. The nine census tracts and 20 census tract block groups included in this analysis are census tract 105 (block group 2), census tract 117 (block groups 1–2), census tract 178.1 (block groups 1–2), census tract 180 (block groups 1–2), census tract 226 (block group 1), census tract 227.02 (block groups 1–2), census tract 607 (block groups 1–3), census tract 611 (block group 1), and census tract 615 (block groups 1–6). This analysis includes data for all block groups that are within the study area, as shown in Figure 3.18-1.

Public Outreach to Environmental Justice Populations

A key component of environmental justice is engaging environmental justice populations as part of the planning process. The TJPA has maintained an active outreach program since completion of the 2004 FEIS/EIR, largely to inform nearby residents and businesses of the progress of Phase 1 construction. Those communications via the TJPA website and regular email blasts have served to keep all populations in the study area apprised of the Transbay Program. The email distribution list, as well as other forms of notification, provided the basis for the public information and outreach program developed for the proposed project.

[1] Central Subway Final SEIS/EIR defines "meaningfully greater" as at least 10 percentage points greater than San Francisco and the Bay Area as a whole.

[2] A 0.5-mile study area or search radius typically is used for transportation projects to account for land use and circulation effects; the proposed project components, including vent structures, underground infrastructure refinements to accommodate the Downtown Rail Extension, and local transportation enhancements are discrete and localized adjustments to the Transbay Program, and the extent of potential impacts would be captured reasonably within the 0.25-mile study area.

Sources: City and County of San Francisco 2013; U.S. Census Bureau 2010; compiled by AECOM in 2014

Figure 3.18-1 Environmental Justice Communities within 0.25 Mile of the Proposed Project

The outreach program has consisted of three primary components:

- Widespread announcements (via mailers, emails, and newspaper ads) in April 2013 informing the surrounding community of TJPA's intent to prepare an environmental document and to host a scoping meeting;

- A scoping meeting in May 2013 providing the community with background information about the project, the potential effects, and a forum for asking questions about the environmental process; and

- Targeted outreach to environmental justice organizations in January 2015 to inform organization representatives about the project and its effects and to request input on the project and information about other environmental justice populations and organizations.

The identification of project area environmental justice organizations was based on a review of a neighborhood socioeconomic profile completed by the City and County of San Francisco (City of San Francisco 2012), the most recent Census data, the current American Community Survey estimates, and lists of community and social organizations in the project area. Invitations were extended to these organizations to better understand the populations served by them, to determine if other organizations should be consulted, and to present the potential effects and mitigation measures. In January 2015, the TJPA met with representatives of the following organizations to review the project and its effects and to solicit further consideration of potential environmental justice concerns:

- South of Market Community Action Network - a multi-racial, community organization that educates, organizes and mobilizes the immigrant and low-income South of Market (SoMa) residents to achieve social and economic justice and equity. The organization primarily serves economically disadvantaged residents of SoMa.

- Asian Neighborhood Design - a non-profit architecture, community planning, employment training and support services organization dedicated to reduce poverty and revitalize neighborhoods in the Bay Area by building healthy communities and providing opportunities for low-income residents. This group is located in SoMa and works with economic disadvantaged communities throughout San Francisco.

- Filipino American Development Foundation - a non-profit organization founded to strengthen the social and economic well being of the Filipino American community in the SoMa neighborhood in San Francisco with special attention to the underserved segments of the community.

These groups, as well as other identified organizations, have been included in the TJPA's list for public notices and communications, and will be advised of ongoing TJPA activities as highlighted in Chapter 7, Coordination and Consultation, of this SEIS/EIR.

Race and Ethnicity

Table 3.18-1 shows the percentage of ethnic and racial minority populations by census tract and block group within the study area. Seven census tract block groups have ethnic and racial minority populations greater than 50 percent. The City and County of San Francisco as a whole has an ethnic and racial minority population of 55 percent. See Section 3.4, Socioeconomics, Population, and Housing, for a more detailed discussion of race and ethnicity as it pertains to the proposed project study area. Specifically, Table 3.4-4 provides a summary of race and ethnic characteristics of the city.

Table 3.18-1
Ethnic and Racial Minorities by Census Tract Block Group in 2010

Census Tract	Block Group	Ethnic and Racial Minority (%)	EJ Community
Census Tract 105	Block Group 2	31	No
Census Tract 117	Block Group 1	69	**Yes**
	Block Group 2	59	**Yes**
Census Tract 178.01	Block Group 1	84	**Yes**
	Block Group 2	65	**Yes**
Census Tract 180	Block Group 1	46	No
	Block Group 2	60	**Yes**
Census Tract 226	Block Group 1	27	No
Census Tract 227.02	Block Group 1	25	No
	Block Group 2	27	No
Census Tract 607	Block Group 1	54	**Yes**
	Block Group 2	44	No
	Block Group 3	38	No
Census Tract 611	Block Group 1	85	**Yes**
Census Tract 615	Block Group 1	40	No
	Block Group 2	43	No
	Block Group 3	49	No
	Block Group 4	42	No
	Block Group 5	44	No
	Block Group 6	39	No
City and County of San Francisco		55	

Note:
EJ = environmental justice; EJ population identified when the percentage of ethnic and racial minority in a census block is greater than 50 percent.
Source: U.S. Census Bureau 2010

Poverty Status

Based on the 2007–2011 American Community Survey estimates (U.S. Census Bureau 2012), the percentage of households living below the poverty level in the City and County of San Francisco is 12 percent. Census tracts 117 (block group 2), census tract 178.01 (block group 1), and census tract 611 (block group 1) have a percentage of households living below the poverty line at least 10 percentage points higher than the countywide average (Table 3.18-2). Poverty status and median income are further discussed in Section 3.4, Socioeconomics, Population, and Housing.

Study Area Environmental Justice Communities

Based on the above demographic profiles for minority and low-income populations, environmental justice census tract block groups are in the study area. Seven census tract block groups would be defined as ethnic minority communities and three census tract block groups are low-income communities. These environmental justice communities are shown in Figure 3.18-1, along with the proposed project components.

Table 3.18-2
Population Under the Poverty Level by Census Tract Block Group, 2007–2011

Census Tract	Block Group	Population Under Poverty Line (%)	EJ Community
Census Tract 105	Block Group 2	10	No
Census Tract 117	Block Group 1	10	No
	Block Group 2	35	**Yes**
Census Tract 178.01	Block Group 1	42	**Yes**
	Block Group 2	14	No
Census Tract 180	Block Group 1	19	No
	Block Group 2	14	No
Census Tract 226	Block Group 1	0	No
Census Tract 227.02	Block Group 1	6	No
	Block Group 2	1	No
Census Tract 607	Block Group 1	8	No
	Block Group 2	5	No
	Block Group 3	9	No
Census Tract 611	Block Group 1	29	**Yes**
Census Tract 615	Block Group 1	4	No
	Block Group 2	13	No
	Block Group 3	6	No
	Block Group 4	7	No
	Block Group 5	12	No
	Block Group 6	18	No
City and County of San Francisco		12	

Note:
EJ = environmental justice; EJ population identified when the percentage of households living below the poverty line in a census block is at least 10 percentage points higher than the countywide average of 12 percent.
Source: U.S. Census Bureau 2012

Regulatory Framework

The following discussion summarizes relevant laws, regulations, and policies concerning environmental justice communities, including new guidance issued since the 2004 FEIS/EIR.

Federal

Title VI of the Civil Rights Act (42 USC Section 2000[d] et seq.)

Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, national origin, age, sex, or disability in programs and activities receiving federal financial assistance.

Executive Order 12898

Executive Order 12898, known as the Federal Environmental Justice Policy, requires federal agencies to address, to the greatest extent practicable and permitted by law, the potential disproportionately high, adverse human health and environmental impacts of their programs, policies, and activities on minority and low-income populations. Federal agency responsibilities under this Executive Order also apply to Native American programs. U.S. Department of Transportation (DOT) Order 5610.2 defines

environmental justice to mean an adverse impact that is predominately borne by a minority population and/or a low-income population, or that would be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than would be suffered by the non-minority population and/or non-low-income population (DOT Order 5610.2, Appendix Definitions, sub.[g]).

Local

San Francisco General Plan

The proposed project site lies in the jurisdiction of the City. State law requires that each local jurisdiction adopt a comprehensive general plan to guide its physical development. The San Francisco General Plan is the official City policy document guiding planned development in its jurisdiction. The Commerce and Industry Element and the Housing Element of the General Plan include policies and objectives pertaining to employment, population, and housing. The San Francisco Sustainability Plan, adopted in 1997, contains policy guidance in 10 specific environmental issue areas and five general areas, including economic development and environmental justice.

San Francisco Administrative Code

Chapter 6.22 and Chapter 83 of the San Francisco Administrative Code address requirements for local hiring for certain activities taking place in the city, including infrastructure improvement projects.

3.18.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

NEPA and CEQA incorporate differing provisions affecting identification and mitigation of socioeconomic impacts. More specifically, this environmental analysis is framed by the following guidelines:

- Under NEPA, agencies must consider the composition of the affected area to determine whether low-income or minority populations are present and whether disproportionately high and adverse human health or environmental effects on these populations may occur.

- CEQA defines the environment as the physical conditions that exist within the area that will be affected by a project. The environment does not include social or economic conditions. Pursuant to CEQA, social or economic changes do not, by themselves, constitute significant effects on the environment, although social or economic changes related to a physical change may be considered in determining whether the physical change is significant. Hence, CEQA does not consider socioeconomic impacts and environmental justice, by themselves, to be significant effects on the environment; however, CEQA includes consideration of environmental health and safety, which are addressed in the following sections of this SEIS/EIR: Section 3.2, Transportation; Section 3.8, Water Resources and Water Quality; Section 3.10, Hazardous Materials; Section 3.12, Noise and Vibration; Section 3.13, Air Quality; and Section 3.16, Safety and Security.

Because Section 5.3.5 Environmental Justice (pages 5-36 to 5-37) from the 2004 FEIS/EIR determined that no significant impact on an environmental justice community would occur, the purpose of this SEIS/EIR is to determine if the socioeconomic characteristics have changed since approval of the 2004 FEIS/EIR, or if the additional components of the proposed project would have impacts related to an environmental justice community.

The proposed project would have a potentially significant impact related to environmental justice if it would disproportionately impact ethnic minority populations or low-income populations. Disproportionately high and adverse human health and environmental effects occur when an adverse effect does either of the following:

- is predominantly borne by a minority population and/or a low-income population, or
- will be suffered by a minority population or low-income population and is appreciably more severe or greater in magnitude.

As defined in the appendix of DOT Order 5610.2 (DOT 2012), adverse effects include the following:

- Bodily impairment, infirmity, illness, or death
- Air, noise, or water pollution, or soil contamination
- Destruction or disruption of built or natural resources
- Destruction or diminution of aesthetic values
- Destruction or disruption of community cohesion or a community's economic vitality
- Destruction or disruption of the availability of public or private facilities and services
- Vibration
- Adverse employment effects
- Displacement of persons, businesses, farms, or nonprofit organizations
- Increased traffic congestion, isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community
- The denial of, reduction in, or significant delay in the receipt of benefits of DOT programs, policies, or activities

Environmental Analysis

No Action Alternative

Under the No Action Alternative, where Phase 2 of the approved Transbay Program will be implemented and the proposed project described in this SEIS/EIR would not be implemented, the environmental justice impacts will be the same as those presented in Section 5.3.5 Environmental Justice (pages 5-36 to 5-37) of the 2004 FEIS/EIR and the subsequent addenda. The 2004 FEIS/EIR concluded that the Transbay Program will have no adverse effects on minority or low-income communities, and that no mitigation measures will be required. A summary of those previously analyzed effects is provided below.

The Transbay Program area as a whole has relatively similar or smaller percentages of ethnic and minority populations than the City. Therefore, implementation of the Transbay Program will have no long-term adverse effects on minority or low-income communities. The Federal Transit Administration Record of Decision, dated February 8, 2005, concluded based on the 2004 FEIS/EIR that the Transbay Program will not have an adverse impact that predominately will be borne by a minority population and/or a low-income population, or that will be suffered by the minority population and/or low-income

population, and that will be appreciably more severe or greater in magnitude than will be suffered by the non-minority population and/or non-low-income population.

Proposed Project

Impact EJ-1: The proposed project would not disproportionately impact ethnic minority or low-income, populations. (No Adverse Effect)

Seven environmental justice communities are present in the vicinity of the proposed project. These communities have a meaningfully greater percentage of low-income and minority populations than the City and County of San Francisco as a whole. The following analysis identifies proposed project impacts and determines whether they would be adverse and, if so, whether they would disproportionately affect environmental justice communities. Environmental justice analysis requires a balancing of disproportionate impacts on minority and low-income populations with the potential benefits of the proposed project; this assessment is summarized in Table 3.18-3.

Effects/Impacts by Resource Topic. For the following resource areas, no adverse effects were identified and no adverse impacts would occur on any population, including environmental justice communities, in the study area: Land Use and Planning; Geology, Soils, and Seismicity; Greenhouse Gas and Climate Change; Public Services, Community Services, and Recreational Facilities; and Safety and Security.

Resource areas that may have adverse impacts that would be reduced with implementation of mitigation measures are Transportation; Socioeconomics, Population, and Housing; Visual Quality/Aesthetics; Historic and Cultural Resources; Biological Resources; Water Resources and Water Quality; Hazardous Materials; Electromagnetic Fields; Air Quality; and Utilities. These resource areas are described further in Table 3.18-3.

In summary, the proposed project could have adverse effects associated with construction noise and vibration after implementation of recommended mitigation measures. The nighttime construction effects would only occur if the City waives the restriction against construction between 8pm and 7am. These construction effects would be experienced throughout the project area near all of the proposed project components. Four of these components (the Third and Townsend vent structure and construction staging/access area, the realigned underground Fourth and Townsend Station, the tunnel stub box, and the additional trackwork south of the Caltrain railyard) involve sites that are either within or adjacent to a census block with environmental justice populations.

Benefits of the Proposed Project. A disproportionate effect on an environmental justice population is dependent on the net results after consideration of the potential benefits of the proposed project. Implementation of the proposed project would include direct long-term mobility benefits to all of the neighborhoods in the project area and are expected to be equitably shared across communities by various demographic groups, including transit-dependent and environmental justice populations. Improved mobility and connectivity to public transportation would enhance access to places of employment, public facilities, and social, religious, and community facilities in the City. Moreover, the proposed project would enable the Caltrain and HSR services to connect to the retail and financial core of San Francisco, offering travel options to areas in greater Bay Area and eventually throughout the state.

In addition, the proposed project would enable increased ridership on Caltrain and HSR service. The diversion of trips from automobile to these rail transit systems would reduce overall vehicle miles traveled with the associated reductions to criteria air pollutants and greenhouse gas emissions. As a result, the proposed project would help attain local, regional, and state goals for improved sustainability and environmental quality.

Table 3.18-3
Analysis of Executive Order 12898 (Environmental Justice Communities)

Environmental Resource	Impacts Summary	Relevance to Environmental Justice
Transportation	The proposed project would result in temporary construction impacts that could require travel-lane or sidewalk closures that may temporarily disrupt circulation patterns. Operation of the turnback track would result in potential adverse circulation impacts along 16th Street east to Owens Street, and potential additional safety risks for pedestrians. With implementation of an overall construction management plan as well as New-MM-TR-1.1, access would remain available to neighborhoods, levels of service would be maintained, safe pedestrian and bicyclist conditions would be provided, and no adverse impacts would occur.	With development of an overall construction management plan and implementation of New-MM-TR-1.1, access for environmental justice communities would not be inhibited and safe pedestrian and bicyclist conditions would be provided. The proposed project would not deny environmental justice communities access to transit services or a Department of Transportation program. No disproportionate adverse impacts on environmental justice communities would occur.
Socioeconomics, Population, and Housing	The proposed project would require full or partial acquisitions of four to six parcels, resulting in a loss of jobs. Implementation of mitigation measures from the 2004 FEIS/EIR would require the TJPA to provide assistance to displaced businesses in accordance with state and federal land acquisition and relocation laws.	Potential adverse effects from job loss would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Visual Quality/ Aesthetics	A potential exists for new sources of light at the intercity bus facility to adversely affect surrounding land uses. Implementation of Mitigation Measure VA 1 from the 2004 FEIS/EIR would minimize spillover lighting to the extent possible.	Potential adverse light and glare effects would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Historic and Cultural Resources	The proposed project could result in discovery of archaeological resources during construction activities. Modification of previously adopted mitigation measures from the 2004 FEIS/EIR would require the development and implementation of an updated archaeological research design and treatment plan that would minimize potentially adverse effects. The proposed widened throat structure could affect historic properties/historical resources and would result in potentially adverse impacts. Modification of previously adopted mitigation measures from the 2004 FEIS/EIR would be protective of historic properties. The proposed project could result in damage or destruction of previously unknown unique paleontological resources during construction-related activities, however with implementation of New-MM-C-CR-4.1, this potential adverse effect would be avoided and minimized.	Potential adverse effects to cultural and paleontological resources would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Biological Resources	The proposed project has the potential to adversely affect migratory birds. Implementation of New-MM-C-BR-1.1 would require pre-construction bird surveys to avoid nesting birds.	Potential adverse effects to nesting birds would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.

Table 3.18-3
Analysis of Executive Order 12898 (Environmental Justice Communities)

Environmental Resource	Impacts Summary	Relevance to Environmental Justice
Water Resources and Water Quality	The proposed project's construction activities could result in adverse effects related to water quality. Implementation of mitigation measures previously identified in the 2004 FEIS/EIR would reduce potential construction-related water quality impacts. Operation of the proposed project could result in adverse effects related to flooding hazards. Implementation of New-MM-WQ-4.1 would provide flood hazard protection and avoid this adverse effect.	Potential adverse effects related to flooding and construction-related dewatering would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Hazardous Materials	The proposed project's construction activities could result in adverse effects related to the transport, use, or disposal of hazardous materials or wastes, and expose workers, the public, and the environment to known hazardous material sites and to possible asbestos-containing materials and lead-based paints. Implementation of mitigation measures from the 2004 FEIS/EIR would reduce these effects.	Potential adverse effects from hazardous materials releases and exposure to contaminated sites and hazardous building materials would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Electromagnetic Fields	The proposed project could adversely affect sensitive electrical equipment in medical facilities at Mission Bay in close proximity to the additional trackwork south of the Caltrain railyard. Implementation of New-MM-EF-1.1 would avoid electromagnetic interference and other effects from electromagnetic fields.	Potential adverse electromagnetic interference effects would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Noise and Vibration	The proposed project could result in an adverse impact related to operational noise and vibration if a waiver is issued by the City to perform construction activities at night. Construction noise and vibration would be minimized with implementation of mitigation measures from the 2004 FEIS/EIR; however, no additional feasible measures could avoid a potentially adverse effect from nighttime construction activities. Implementation of New-MM-NO-1.1 would ensure that ventilation shaft noise levels do not exceed the recommended noise level design guidelines in high-density residential areas, and New-MM-C-NO-4.1 would protect buildings that contribute to an NRHP-eligible historic district.	Adverse effects from nighttime construction work, if permitted by the City, would occur throughout the project area and would not be concentrated in environmental justice communities. Environmental justice communities would experience adverse nighttime construction noise related to the realigned Fourth and Townsend Station, the tunnel stub box, and the additional trackwork south of the Caltrain railyard. However, non-minority and non-low income populations would also experience adverse nighttime construction noise effects at these sites, as well as all other proposed project construction sites. Thus, the adverse nighttime construction noise effects would not be disproportionately borne by environmental justice populations. All other potential adverse noise and vibration effects would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.
Air Quality	The intercity bus facility and vent structure site at Third and Townsend Streets would potentially expose new and existing sensitive land uses to increased pollutant concentrations during operation of the facility. Implementation of New-MM-AQ-3.1 and New-MM-AQ-3.2 would reduce emissions. Construction equipment and truck exhaust would generate significant oxides of nitrogen (NO_X) emissions. In addition, construction activities would	Potential adverse air quality effects would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur. Environmental justice communities would experience adverse construction air emissions related to the realigned Fourth and Townsend Station, the tunnel stub box, and the additional trackwork south of the Caltrain railyard. However, non-minority and non-low income populations would also experience adverse construction air emissions at these sites, as

Table 3.18-3
Analysis of Executive Order 12898 (Environmental Justice Communities)

Environmental Resource	Impacts Summary	Relevance to Environmental Justice
	generate toxic air contaminants, including particulate matter and diesel particulate matter. Implementation of New-MM-C-AQ-5.1, in addition to Mitigation Measures AC 1 through AC 15 that were previously identified in the 2004 FEIS/EIR and were adopted and incorporated into the approved Transbay Program, would result in the maximum feasible reduction of these emissions. These measures plus the use of Tier 4 equipment that will be phased in starting in 2016 would effectively reduce construction air emission impact to not adverse.	well as all other proposed project construction sites. The adverse construction air quality effects, which would be mitigated, would not be disproportionately borne by environmental justice populations.
Utilities	The proposed project could adversely impact underground utilities during construction, resulting in possible disruption of service to customers. Implementation of Mitigation Measure Util 1 from the 2004 FEIS/EIR would require coordination with utility providers to minimize disruption to customers and avoid adverse construction-related utility effects.	Potentially adverse construction-related impacts on utility service would be mitigated, and no disproportionate adverse effects on an environmental justice community would occur.

Conclusion. The proposed project would result in new adverse construction impacts related to noise and vibration that were not identified in the 2004 FEIS/EIR, even after implementation of mitigation measures. Noise and vibration effects could occur throughout the proposed project area if nighttime construction is permitted by the City between 8 p.m. and 7 a.m. Although noise and vibration impacts would affect environmental justice communities in the vicinity of the realigned Fourth and Townsend Station, the tunnel stub box, and the additional trackwork south of the Caltrain railyard, the localized impact at these locations is not considered disproportionate because the impact would be similar to noise and vibration impacts at other locations along the project alignment.

In conclusion, the adverse effects of the proposed project would not be borne disproportionately by environmental justice communities and the adverse effects would be experienced only during the construction period, compared to the long-term benefits of increased mobility and reduced air quality and greenhouse gas emissions.

3.18.4 Summary of Proposed Project Effects/Impacts

NEPA Summary	
Environmental Justice (Not Adverse)	The 2004 FEIS/EIR concluded that construction of the project would have no long-term adverse effects on minority, low-income and transit dependent communities. The proposed project analyzed in this SEIS/EIR could result in new adverse construction noise effects not identified in the 2004 FEIS/EIR; however, these effects would not be disproportionately borne by environmental justice populations and the overall long-term benefits associated with the proposed project would outweigh the construction-period effects. As a result, the environmental justice effects would not change from those described in the 2004 FEIS/EIR.
CEQA Summary	
No requirement exists to evaluate impacts on environmental justice communities.	

CHAPTER 4 FINANCIAL CONSIDERATIONS/EVALUATION OF ALTERNATIVES

4.1 INTRODUCTION

This chapter presents the updated financial plan for the Transbay Program Phase 2 Downtown Rail Extension (DTX) component as modified by the proposed project. This Financial Considerations chapter covers the current estimated costs and proposed funding plan for all of the Phase 2 refinements, including those that are unchanged since the last approved environmental document. This chapter does not address the costs and funding for the other transportation improvements. The information is not required for environmental review but is presented for informational purposes.

4.2 DESCRIPTION OF TRANSBAY PROGRAM AND PROPOSED PROJECT

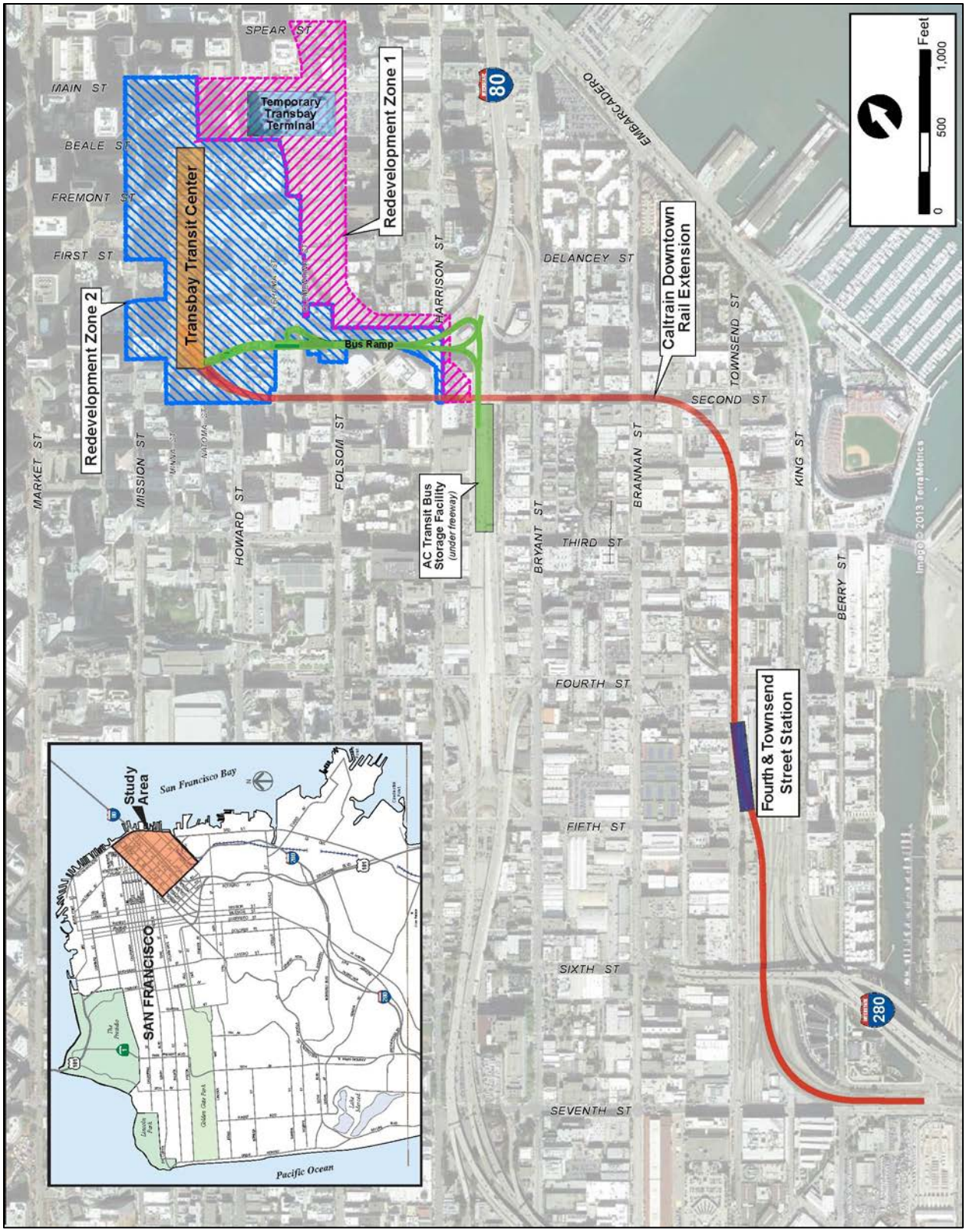
The **Transbay Program** is being built in two separate phases as depicted in Figure 4-1:

- **Phase 1** includes major elements within the new Transit Center, including the foundations and structural shell of the future below-ground rail station (i.e., the train box); the ground-level Grand Hall; the Bus Deck level; Bus Ramps; and City Park, a rooftop park. These components are under construction with a scheduled completion date of 2017.

- **Phase 2** includes an approximately 2-mile rail extension that would bring Caltrain commuter rail service from its current San Francisco terminus at Fourth and King Streets to a new terminus underneath the Transit Center. As part of Phase 2, the fit-out of the train box would be completed, including all elements required for train operation (i.e., tracks, platforms, signaling) as well as the Lower Concourse fit-out including retail and back-of-house spaces. Caltrain commuter rail service would commence sometime between 2022 and 2025; HSR service is anticipated by 2026.

The majority of this environmental document addresses minor refinements to the Phase 2 elements since the original FEIS/EIR was approved in 2004 and subsequent addenda. These changes to Phase 2 elements have been described in this SEIS/EIR as three major components which are collectively referred to as the **proposed project**: Phase 2 refinements, other transportation improvements, and adjacent land development. The adjacent land development component is a collaborative effort by TJPA and the City, and is included in the project description for CEQA purposes. FTA would not have a role in funding or approving this land development, so this component is not part of the NEPA action. Please refer to Chapter 2 for a detailed description of the proposed project.

Phase 2 of the Transbay Program is included as a priority investment for the San Francisco Bay Area region in the Metropolitan Transportation Commission (MTC)/Association of Bay Area Governments (ABAG) Plan Bay Area. MTC is the transportation planning and finance organization for the San Francisco Bay Area. To plan transportation investments that do not exceed revenues that are reasonably expected to be available, the MTC worked with partner agencies and used financial models to forecast how much revenue will be available for transportation purposes over the 28-year duration of Plan Bay Area (ABAG and MTC 2013). MTC's Resolution 3434, a framework identifying regional transit priority projects, was adopted in 2001. Resolution 3434 identified the "Caltrain Downtown Extension" (Phase 2 of the Transbay Program) as one of the region's priority transit and road projects. Building on Resolution 3434 and results of the performance assessments and transit-specific project evaluation, Plan Bay Area identifies the DTX as one of the significant future regional transit investments.



Sources: City and County of San Francisco 2013; compiled by TJPA in 2014

Figure 4-1 Transbay Program Elements Phase 1 & 2

4.3 CAPITAL COSTS AND FUNDING

4.3.1 Estimate of Capital Costs

The TJPA is exploring project delivery options for the DTX component of the Transbay Program including Design-Bid-Build (DBB), Design-Build (DB), and Public-Private-Partnership/Design-Build-Finance-Maintain (P3/DBFM).

- DBB is the most traditional project delivery method. All design work is completed before the project is put out to bid for construction. After the construction is complete, the project sponsor has full responsibility for the facility.

- Under DB, the project sponsor hires a single firm or consortium to handle both design and construction activities. Similar to DBB, after the project is completed, control reverts to the project sponsor.

- DBFM is a newer contracting approach that broadens the set of activities that are packaged into a single contracting vehicle; the method combines design and construction with financing and ongoing maintenance. The DBFM approach may potentially provide cost savings due to the use of private funding to accelerate construction and the long-term nature of the contract, which allows for more innovative design, construction and maintenance approaches.

The estimated cost to build Phase 2 as amended by the proposed project would depend on which delivery method is selected. The 2004 FEIS/EIR reported that the estimated cost to build the entire Transbay Program (Phases 1 and 2) was $1.754 billion in 2003 dollars, assuming a DBB approach. In 2008, the TJPA Board approved a separate budget for Phase 2 components of $2.956 billion in 2008 dollars; the budget assumed a DBB approach.

In October 2013, staff prepared a proposed revision of the Phase 2 budget. If a DBB project delivery is used, the proposed baseline budget would be $3.004 billion. DB and DBFM project delivery methods could result in lower costs due to acceleration of construction. The October 2013 proposed revisions to the Phase 2 budget incorporate the following:

- Revised escalation from 4 percent to 3 percent;

- Revised train operations date from 2020 to 2024;

- Addition of $25M for TJPA contribution to the City and County of San Francisco's proposed railyard reconfiguration;

- Addition of $120M to accommodate City's plan for future grade separation;

- Increased right-of-way acquisition by $105M;

- Added train box extension; and

- Removal of the tail tracks.

The cost estimates for Phase 2 of the Transbay Program presented in this chapter are expressed in current ($2012) and Year-of-Expenditure dollars ($YOE) in Table 4-1. Design engineers initially developed the cost estimate in current (2012) dollars based on the physical construction activities that are planned. The

costs were then escalated using estimates of future inflation rates to determine the projected costs in the year that the expenses are incurred. The values in the Table 4-1 do not include financing costs.

Table 4-1
Transbay Program Phase 2 Cost Estimates in Year-of Expenditures ($YOE)

All numbers in thousands

FTA Cost Category	$2012	$YOE
10 GUIDEWAY & TRACK ELEMENTS	646,311	846,026
20 STATIONS, STOPS, TERMINALS, INTERMODAL	389,611	505,473
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	27,500	37,658
40 SITEWORK & SPECIAL CONDITIONS	523,212	661,864
50 SYSTEMS	54,628	73,781
60 ROW, LAND, EXISTING IMPROVEMENTS	266,200	299,874
70 VEHICLES		
80 PROFESSIONAL SERVICES	322,160	397,971
90 UNALLOCATED CONTINGENCY	142,943	182,085
100 FINANCE CHARGES		
TOTAL	**2,372,565**	**3,004,731**

Source: TJPA 2013

Table 4-1 provides a breakdown of estimated construction costs based on FTA Standard Cost Categories. The basis for the cost estimate is the July 16, 2010, Term 2 Preliminary Engineering (PE) plans, but the estimate reflects a partial update of the PE plans reflecting design/scope modifications, which the California High-Speed Rail Authority (CHSRA) and Caltrain have agreed to incorporate, developed in January 2011.

4.3.2 Proposed Capital Funding

This section provides information about potential funding source for the project.

San Francisco County Sales Tax

Proposition K is a half-cent local transportation sales tax approved by San Francisco voters in 2003 for transportation infrastructure improvements. Prop. K is forecast to generate $2.35 billion ($2003) over 30 years. The San Francisco County Transportation Authority manages the Prop. K sales tax program, and the Prop. K Strategic Plan has committed $83 million to the DTX Project. When Prop. K goes before the voters for reauthorization, the DTX Project may be able to receive additional Prop. K local sales tax funds.

San Mateo County Sales Tax

The San Mateo County Transportation Authority is an independent agency formed to administer the proceeds of a county-wide one-half of one percent sales tax. Voters approved Measure A, which

established the program, in June 1988. Measure A sales tax collections began in January 1989. In 2004, county voters overwhelmingly approved a reauthorization of Measure A through 2033. Resolution 3434, the Regional Transit Expansion Policy, includes approximately $19 million ($2004) of San Mateo Measure A sales tax funds for the DTX project.

MTC/Bay Area Toll Authority (BATA) Bridge Tolls

Toll revenues from the seven state-owned bridges in the Bay Area are administered by the region's transportation planning agency/metropolitan planning organization, MTC. On March 2, 2004, voters passed Regional Measure 2 (RM-2), raising the toll on the seven state-owned toll bridges in the San Francisco Bay Area by $1.00. This extra dollar funds various transportation projects within the region that will reduce congestion or improve travel in the toll bridge corridors, as identified in SB 916. The DTX Project is eligible for certain RM-2 capital funds, and the entire Transit Center is eligible for $3 million per year (escalated by 1.5% per year, starting in July 2004) of RM-2 operating funds for operations and maintenance. Additionally, MTC estimates that bridge toll revenues will total $2.7 billion through 2040, of which certain funds may also be allocated to the DTX Project.

Land Sales (Block 4)

Sale proceeds of a TJPA-controlled parcel of land within the Transit Center District, Block 4, a site immediately adjacent to the Transit Center, is planned to potentially be allocated for the DTX Project. Because the parcel is currently committed for bus operations, this parcel cannot be developed until completion of the Transit Center Phase 1 in late 2017.

Tax Increment

A redevelopment plan providing tax increment financing (TIF) was created for the area surrounding the Transit Center in 2005 to help fund the Transbay Program (including the DTX Project). The assessed value of certain properties within the redevelopment plan area, at the time the authorizing legislation was approved, was recorded at $0. The property tax proceeds derived from any increase in the assessed value of those properties above their 2005 levels has been committed to funding the Transbay Program.

As of August 2015, the TJPA estimates the value of the property tax increment through 2050 will be approximately $1.158 billion. The majority of this revenue stream is currently pledged to repay TJPA's existing $171 million TIFIA loan. The TJPA anticipates that it will be able to generate additional debt capacity as the redevelopment area matures (e.g., parcels are sold and vertical improvements are built) and that the tax increment, after repaying debt service, would be available for the DTX Project.

The TJPA is also exploring the feasibility of extending the current tax increment collection period from 2050 to 2060 and beyond. Any proposed extension of the tax increment collection period must be approved by the City and County of San Francisco.

FTA New Starts

The Federal Transit Administration's (FTA) discretionary New Starts program is the federal government's primary financial resource for supporting locally planned, implemented, and operated major transit capital investments such as the DTX Project. The New Starts program funds new transit facilities and extensions to existing transit systems including rail, bus rapid transit, and ferries. Proceeding through the New Starts "pipeline" involves a significant effort to meet FTA requirements over several years.

The MTC has included the DTX Project in the region's long-range transportation strategy, 2013 Plan Bay Area, with a $650 million New Starts commitment target. The timing of those funds depends on how quickly the region is able to line up non-federal funds. New Starts funding would not be available until all non-federal funds are committed. If the FTA selects the DTX for New Starts funding, that money would be contingent on congressional reauthorization of transportation legislation and annual appropriations for the New Starts program.

Future California High-Speed Rail Funds

Proposition 1A is the Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century approved by California voters in November 2008. The Act approved the issuance of $9.95 billion of State of California general obligation bonds for the 800-mile HSR system, which includes the Transit Center Phase 1 and Phase 2. Bond proceeds must be appropriated by the Legislature and other Prop 1A requirements must be satisfied prior to expenditure. Approximately $4.7 billion has yet to be appropriated for particular projects. The funding outline in the Regional Transportation Plan calls for $557 million in Prop 1A or other HSR (federal or state) funding to be directed to the DTX Project.

Mello-Roos Community Facilities District

A Mello-Roos Community Facilities District (CFD) is a method of financing construction and maintenance of public infrastructure and facilities that enable new development to occur. Once formed, a CFD allows the levy of a special tax on properties within the CFD. The City and County of San Francisco's Transit Center District Plan (TCDP) anticipated formation of a CFD around the Transit Center pursuant to which properties within the district that benefit from upzoning would be subject to the special tax. The San Francisco Board of Supervisors introduced the Transbay CFD formation legislation in June 2014 and the formation was finalized and adopted in January 2015. The special tax will apply to new construction within the TCDP area that benefits from upzoning, and will be an annual assessment for 30 years based upon building area and type of occupancy. The TCDP and its associated documents, including the Program Implementation Document, reserves 82.6 percent of all proceeds from the Transbay CFD for TJPA projects.

Potential Passenger Facility Charges

A ridership fee or passenger facility charge (PFC) for Caltrain and/or the HSR passengers into the Transit Center is a possible source of funding for the DTX Project. The implementation of a PFC would need to be negotiated between the TJPA and transit agencies and would likely be based on the number of passengers who embarked or disembarked using the Transit Center. The Boards of Caltrain and CHSRA would need to adopt any PFCs dedicated to the DTX Project.

4.4 OPERATING COSTS AND FUNDING

Future operating costs of Phase 2 of the Transbay Program are currently being evaluated. Operating costs would include maintenance, security, janitorial, and utility services. It is anticipated that TJPA would not be responsible for operating costs associated with rail elements, such as the trackage, signaling, or overhead catenary applications. Operating costs for Phase 2 are highly dependent on year-to-year economic conditions, availability of resources, and/or capacity in the local to worldwide marketplace; thus, they are difficult to estimate at this time.

TJPA anticipates that operating costs for the Transbay Program would be paid for by, among potential other sources, lease revenues, and RM-2 operating funds ($3 million per year starting in July 2004, subject to 1.5% annual escalation). Additionally, the major rehabilitation and replacement for the entire

Transit Center would be partially funded by a capital replacement reserve account composed of excess net tax increment revenues. The exact breakdown of costs and budgets for operations and maintenance will be determined as designs are finalized.

4.5 RISK ANALYSIS

A risk analysis accounts for potential issues that could increase the total project costs as a result of schedule delays. Some potential sources of risk for Phase 2 include:

- Due to the early stage of Phase 2, limited refinements to the design may occur before design development documents are complete. Such refinements may increase the cost of the project; however, the level of design development is considered to be appropriate for a project at this stage. Schedule delays could be related to unforeseen construction challenges, equipment malfunctions, or general construction delays.

- There is a risk to the schedule of Phase 2 due to the City, State, Federal and other stakeholder coordination required, in addition to the remaining design and engineering tasks.

- Certain funding sources and revenues outlined above are estimates, are not currently committed to the DTX Project, and/or are subject to change.

- Potential changes in project scope and conditions may also be considered a risk for potential delays. Current cost estimates are based on the 30 percent PE design. As the project progresses into final engineering and design, the estimate will become more precise as the project is refined. Cost increases could occur as a result of, for example, unexpected soil conditions and geotechnical issues, the need for unexpected utility relocations, unanticipated groundwater and other environmental impacts and mitigation measures. The current cost estimate includes contingencies to cover these and other reasonably anticipated changes.

4.6 EVALUATION OF ALTERNATIVES

As an SEIS/EIR, the focus of this environmental document is to examine the modifications proposed to the previously approved Transbay Program. The project approved by the local agencies in 2004 and by the FTA in 2005 is the Transbay Program, described in this SEIS/EIR as the No Action Alternative. This alternative defines the transportation improvements that would be constructed in the absence of any of the refinements and modifications identified in this SEIS/EIR as the proposed project.

The No Action Alternative would support some aspects and only partially or fail to achieve other aspects of the purpose and need established for the proposed project. Specifically, the expanded purpose and need for the proposed project includes:

- Enhance pedestrian, bicycle, and transit connections to further reinforce the Transbay Program's emphasis on transit and alternative means of local and regional travel – the No Action Alternative supports this objective, but the proposed project would more fully satisfy this objective through the addition of an intercity bus facility, bicycle ramp and storage for bicycles in the Transit Center, and a more direct pedestrian connection to BART/muni transit services.

- Modify the train box and advance construction of other rail-related infrastructure to respond to design specifications issued by the CHSRA to enable HSR service and Caltrain – the No Action Alternative does not include the widened throat structure and the extended train box that are part of the proposed project and needed to enable HSR to access and serve the Transit Center.

- Offer additional opportunities for parking within convenient walking distance of the area's existing and proposed restaurants and entertainment, performance, and sports venues – the No Action Alternative includes new land uses, destinations, and parking in the project area and supports this objective; however, the proposed project also allows public parking of the AC Transit bus storage facility when it is not needed by AC Transit buses.

- Determine sites configurations for and construct ventilation shafts/emergency tunnel exit structures in compliance with safety standards for underground facilities and to meet emergency response needs of system operations – the No Action Alternative identifies locations for ventilation shafts/emergency that were appropriate for the level of design completed at the time of the 2004 FEIS/EIR; however, more advanced designs considered in the proposed project comply with National Fire Protection Association Standard 130, which establishes life safety standards and minimum distances between emergency exits to the surface.

- Promote opportunities to develop land uses in conjunction with the proposed project's transportation facilities in a manner consistent with the City's land use goals and supportive of transit use – the No Action Alternative includes a Redevelopment Plan component that satisfies this objective; the proposed project also includes additional development opportunities on transportation facility sites that are not fully used by the facility and can accommodate other uses consistent with City zoning.

CHAPTER 5 OTHER CEQA/NEPA CONSIDERATIONS

5.1 INTRODUCTION

This chapter presents discussions required by CEQA and NEPA beyond the analyses and topic-specific environmental analysis presented in Chapters 1 through 3 of this SEIS/EIR. This section addresses significant and unavoidable impacts/adverse effects, irreversible and irretrievable commitment of resources, growth-inducing effects, and the relationship between local short-term uses of the environment and long-term productivity.

5.2 SIGNIFICANT UNAVOIDABLE ADVERSE EFFECTS

As required by CEQA Guidelines Section 15126.2(b), an EIR must describe any significant impacts that cannot be avoided, including those impacts that can be mitigated but not reduced to a less-than-significant level. Similarly, the CEQ Regulations for Implementing NEPA (40 CFR 1502.16) requires that the NEPA document to discuss any adverse environmental effects which cannot be avoided should the proposal be implemented. Chapter 3 of this SEIS/EIR describes the potential environmental consequences of the proposed project and recommends mitigation measures to reduce impacts, where feasible.

As described in Chapter 3, the proposed project would result in a new adverse effect/significant impact related to nighttime construction noise. Mitigation Measures NoiC 1 through NoiC 6, which were adopted and incorporated into the Transbay Program, would continue to apply and would reduce potential noise impacts from proposed project construction activities. However, if nighttime construction activities are performed between 8 p.m. and 7 a.m., a potential would exist for the ambient noise levels to increase by 5 dBA or more, resulting in an adverse effect/significant and unavoidable impact on nearby residents. Nighttime construction, and the potentially adverse effect on nearby residents, would occur only if the City waived its standard construction hours of 7 a.m. to 8 p.m.

The proposed project would result in a new significant and unavoidable impact under CEQA because of the effect of sea-level rise projected by the year 2100. Portions of the project area could experience inundation up to 6 feet, based on the most conservative assumptions and scenarios (i.e., greatest impact). New-MM-CU-WQ-9.1 would require future planning efforts to determine adaptive management strategies for sea-level rise in the eastern part of San Francisco. Because no assurance exists that effective mitigation could be implemented to reduce the flooding effects to less than significant, the impact of sea-level rise in 2100 would remain significant and unavoidable under CEQA.

5.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES/ SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines Section 15126.2(c) and NEPA 40 CFR 1502.16 require analysis of significant irreversible and irretrievable effects. CEQA requires that an EIR analyze the extent to which the proposed project's primary and secondary effects would impact the environment and commit nonrenewable resources to uses that future generations would not be able to reverse. NEPA requires an explanation of which environmental impacts are irreversible or would result in an irretrievable commitment of resources. Irreversible effects would primarily result from the use or destruction of a specific resource, such as energy and minerals that could not be replaced within a reasonable time frame. Irretrievable resource commitments would involve the loss in value of an affected resource that could not be restored as a result of the action; an example of this is the extinction of a threatened or endangered species, or the disturbance of a cultural resource.

Construction and operation of the proposed project, similar to the No Action Alternative, would result in the use of nonrenewable resources during construction, including fossil fuels, natural gas, water, labor, and building materials such as concrete and steel. The use of raw building materials for construction of the proposed project would be an irretrievable commitment of resources from which these materials are produced. Commitment of labor and fiscal resources for construction and operation is considered irretrievable. However, the proposed project is not anticipated to consume substantial amounts of energy or use other resources in a wasteful manner. City regulations, such as the Construction and Demolition Debris Recovery Program Ordinance, Strategies to Address Greenhouse Gas Emissions, and the San Francisco Green Building Code, require the implementation of best management practices and design guidelines and standards that promote sustainability and avoidance of wasteful consumption of resources. The proposed project would facilitate and enable Caltrain and future high-speed train service to the new Transit Center, which would, in turn, reduce regional vehicle miles traveled and the consumption of nonrenewable fossil fuel resources. The forecast indicates that the ridership on these rail transit systems will result in increased ridership each year, which will result in regional GHG emission reductions which will benefit the community. The estimated emission reductions are included in Section 3.14, Greenhouse Gases and Climate Change.

5.4 GROWTH INDUCEMENT

As required by CEQA Guidelines Section 15126.2(d), an EIR must discuss ways in which the project could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding area. Similarly, NEPA requires discussion of indirect effects (40 CFR 1508.8[a]), which may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems. Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place without implementation of the proposed project. Typically, the growth-inducing potential of a project would be considered significant if it results in growth or population concentration that exceeds those assumptions included in pertinent master plans, land use plans, or projections made by regional planning authorities. However, the creation of growth-inducing potential does not automatically lead to growth, whether it would be below or in exceedance of a projected level. The environmental effects of induced growth would be secondary or indirect effects of the proposed project. Secondary effects of growth could result in significant impacts/adverse environmental effects, which could include increased demand on community or public services, increased traffic and noise, and degradation of air and water quality.

Growth rates and patterns within an area are influenced by a number of local, regional, and nationwide factors that reflect ongoing social, economic, and technological changes. The amount and location of population growth and economic development that occurs within a specific area is in large part regulated by city and county governments through zoning, land use plans, and other policies related to development. Local government and other regional, state, and federal agencies also make decisions regarding the location, sufficiency and funding of infrastructure (e.g. transportation facilities, water facilities) that may influence growth rates and the location of future development.

In general, transportation projects in an already developed corridor (such as the approved Transbay Program and the changes to the Program in the proposed project) are planned jointly with future changes in land use and accommodate the new growth. The Metropolitan Transportation Commission (MTC is the Metropolitan Planning Organization for the San Francisco Bay Area) and Association of Bay Area Governments project that the San Francisco Bay Area will add 1.1 million jobs, 2.1 million people, and 660,000 homes between 2010 and 2040 (MTC and ABAG 2013). Downtown San Francisco alone is expected to grow by 30,000 residents and 61,000 jobs between 2005 and 2030. These forecasts, which are documented in Chapter 1, Purpose and Need, and Section 3.4, Socioeconomics, Population and Housing,

show that the populations of the region and the City of San Francisco are expected to increase substantially in the next 25 years. The MTC and ABAG also acknowledge that downtown San Francisco already is congested, and that the region needs to find ways to provide congestion relief by investing in the public transit system.

The approved Transbay Program, with the proposed project changes, is planned to serve transit needs, enable HSR service to the Transit Center, enhance connectivity between transit systems, and facilitate planned growth on underutilized properties in downtown San Francisco. Although the approved Transbay Program and proposed project would serve regional and corridor-wide growth and travel demands, it also is reasonable to expect that new development, in addition to that already planned or proposed, could be fostered by improved transit services and accessibility to the Caltrain and HSR systems.

Implementation of the proposed project components are not expected to induce growth beyond the growth that was analyzed in the 2004 FEIS/EIR, TCDP EIR, and Central SoMa EIR (currently underway). The proposed project would include construction and operation of new project components that are refinements to the approved Transbay Program, other transportation improvements that enhance local and regional connectivity, and land development co-located with several of the transportation facilities. As explained in Section 3.1, the land development associated with the vent structure sites and intercity bus facility meets the definition of a mixed-use residential, residential, or employment center infill project in a transit priority area under SB 743. Therefore, aesthetic impacts of these uses are not considered impacts on the environment under CEQA.

Under NEPA, the land development associated with the proposed vent structures and intercity bus facility are not considered part of the NEPA action. However, because the potential future development of the vent structure sites and intercity bus facility site are reasonably foreseeable but are not under the FTA's jurisdiction, the development would be considered an indirect effect under NEPA. The additional residential units and commercial floor area would be the same or less than were evaluated previously in the 2004 FEIS/EIR and are within the projected growth planned for the area.

The potential adjacent land development would be considered transit oriented, and the sites' proximity to the Transit Center and the Fourth and Townsend Street Station would provide incentives for occupants to walk or bicycle. The proposed project components would facilitate and enable Caltrain and HSR to reach the San Francisco downtown retail, office, and financial district core, and could have a growth-inducing effect by accelerating planned development in the area. These new transportation facilities and additional development potential would continue to promote the creation of a new neighborhood that is emerging in the South of Market area, with a focused concentration within the Central SoMa and TCDP areas and around the new Transit Center.

This change in the land use pattern and population/employment density is consistent with and encouraged by the City's adopted plan for the area around the Transit Center, to help shape and define the character and intensity of the area. Adopted in 2012, the TCDP explicitly encourages and plans for growth that would benefit from the Transbay Program. Accordingly, the proposed project would not induce growth that would be inconsistent with or exceed the development plans or population/employment forecasts for the proposed project area. The secondary effects of the Transit Center District Plan were evaluated as part of the Transit Center District Plan EIR (City of San Francisco 2012). The Central SoMa Plan also encourages transit-oriented growth with goals and policies that address land use, building size and heights, transportation, public realm, preservation of historic buildings, and environmental sustainability (City of San Francisco 2014). Rezoning of the land use in the Central SoMa Plan area is intended to increase the amount of allowable development and to specifically allow more job growth.

5.5 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

As required by NEPA, 40 CFR 1502.16 requires an EIS to consider the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. As described in the topic-specific environmental analysis presented in Chapter 3 of this SEIS/EIR, short-term adverse effects would be minimized by implementing the mitigation measures for construction-related effects. Furthermore, the short-term effects of the proposed project are expected to be outweighed by the long-term beneficial effect of the proposed project and the overall Transbay Program, which would provide improved public access to bus and rail services, would modernize and improve bus and rail service, would reduce non-transit vehicle usage, and would alleviate blight and revitalize the area of the former Transbay Terminal. Therefore, the proposed project would not be expected to adversely affect the long-term productivity of the environment. Instead, the reduction in regional vehicle miles traveled, consumption of fossil fuels, and emissions of greenhouse gases would serve to enhance long-term productivity.

CHAPTER 6 SECTION 4(f) EVALUATION

6.1 INTRODUCTION

This chapter provides an evaluation of the proposed project relative to Section 4(f) of the Department of Transportation Act of 1966, as amended (49 United States Code [USC] 303and 23 USC 138) and the FTA and FHWA joint implementing regulation at 23 CFR Part 774. Section 4(f), a law applying only to agencies within the U.S. Department of Transportation, including the FTA, states it is the policy of the federal government "that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites" (49 USC 303). Section 4(f) specifies that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of National, State, or Local significance located on public or private land, only if there is no prudent and feasible alternative to using that land; and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use, or the project has a de minimis impact.

According to 23 CFR 774.3, 774.5, and 774.17, the following criteria must be met to reach a de minimis impact determination:

- For parks, recreation areas, and wildlife and waterfowl refuges, a de minimis impact determination may be made if the FTA concludes the transportation project will not adversely affect the activities, features, and attributes qualifying the property for protection under Section 4(f) after mitigation. In addition, to make a de minimis impact determination, there must be:
    - Public notice and opportunity for public review and comment.
    - Concurrence on the effect finding is received from the official(s) with jurisdiction over the property.
- For a historic site, a de minimis impact determination may be made if, in accordance with the Section 106 process of the National Historic Preservation Act (NHPA), FTA determines that the transportation program or project will have no effect or no adverse effect on historic properties, and FTA has received written concurrence from the official(s) with jurisdiction over the property (e.g., the State Historic Preservation Officer [SHPO]) and has taken into account the views of consulting parties to the Section 106 process as required by 36 CFR Part 800.

This Draft Section 4(f) Evaluation provides notification of the FTA's intent to pursue de minimis impact determinations for the following historic resources:

- Contributor to Rincon Point/South Beach District & South End Historic District (180 Townsend Street)
- Contributors to Second and Howard Street District (589 Howard Street, 165-173 Second Street)
- San Francisco Fire Department (SFFD) Auxiliary Water Supply System

The proposed de minimis impact determinations are based on ongoing coordination with the officials with jurisdiction. The officials with jurisdiction are federal or designated State agencies that own and/or administer the affected portion of the property protected by Section 4(f). The above Section 4(f)

properties are historic resources subject to protection under the NHPA, and the relevant official with jurisdiction for these resources is the SHPO. The SHPO has been notified of the FTA's intent to make a de minimis impact determination. If the SHPO concurs, the FTA will issue determinations of de minimis impact as part of the Final Section 4(f) Evaluation in the Record of Decision. Pursuant to 23 CFR 774.5(b)(2), notice is hereby provided of the proposed de minimis impact determinations, which are made available in this document for public review and comment.

As described in Section 3.15, Public Services, Community Services, and Recreational Facilities, there are publically-owned parklands and recreation areas in the vicinity of the proposed project. However, none of these parklands or recreational areas would be impacted by the proposed project. There are no wildlife or waterfowl refuges in the vicinity of the proposed project.

6.2 REGULATORY FRAMEWORK

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 USC 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

The FTA cannot approve a transportation project that uses a Section 4(f) property unless the agency determines that:

- There is no feasible and prudent avoidance alternative to the use of land from the Section 4(f) property, and the action includes all possible planning to minimize harm to the property resulting from such use (23 CFR 774.3(a)); or

- The use of the Section 4(f) property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant would have a de minimis use on the property (23 CFR Part 774.3(b)).

Feasible and prudent avoidance alternatives are those that avoid using any Section 4(f) property and do not cause other severe problems of a magnitude that substantially outweigh the importance of protecting the Section 4(f) property (23 CFR Part 774.17).

6.2.1 Definition of Use

A use of Section 4(f) property is defined in 23 CFR Part 774.17 and occurs when:

- Land is permanently incorporated into a transportation facility;

- There is a temporary occupancy of land that is adverse in terms of the Section 4(f) statute's preservationist purposes; or

- There is a constructive use of a Section 4(f) property.

A de minimis impact determination may be made for a permanent incorporation or temporary occupancy resulting in a use of a Section 4(f) property where, after taking into account any measures to minimize harm (such as avoidance, minimization, mitigation or enhancement measures), the net impact results in either:

1. For a historic site, a Section 106 finding of no adverse effect or no historic properties affected; or

2. For parks, recreation areas, and wildlife and waterfowl refuges, a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f).

Unlike a Section 4(f) evaluation, use of Section 4(f) property having a de minimis impact finding can be approved by the FTA without the need to develop and evaluate alternatives that would avoid using the Section 4(f) property. A de minimis impact determination is a finding and avoidance or alternative analysis is not required because avoidance, minimization, mitigation, or enhancement measures are included as part of the determination. De minimis impact findings must be expressly conditioned on the implementation of any measures that were relied on to reduce the impact to a de minimis level. The implementation of such measures will become the responsibility of the project sponsor with FTA oversight.

6.2.2 Officials with Jurisdiction

In the case of historic sites, the officials with jurisdiction are, in general, the SHPO, or, if the property is located on tribal land, the Tribal Historic Preservation Officer (THPO). When the Advisory Council on Historic Preservation (ACHP) is involved in consultation concerning a property under Section 106 of the NHPA, the ACHP is also an official with jurisdiction over that resource for the purposes of Section 4(f). When the Section 4(f) property is a National Historic Landmark (NHL), the designated official of the National Park Service is also an official with jurisdiction over that resource for the purposes of Section 4(f).

In the case of public parks, recreation areas, and wildlife and waterfowl refuges, the officials with jurisdiction are the officials of the agency or agencies that own or administer the property in question and who are empowered to represent the agency on matters related to the property.

6.3 SUMMARY OF THE 2004 FINAL SECTION 4(f) EVALUATION

In the 2004 FEIS/EIR, it was determined that the Transbay Program would involve the use of the following Section 4(f) properties:

- Transbay Terminal, an NRHP-eligible resource and contributory element to the San Francisco-Oakland Bay Bridge, a multi-component NRHP-listed property due to its then-proposed demolition and removal – this structure was demolished as part of the approved Transbay Program Phase 1.

- Transbay Terminal ramp and bridge approaches, contributing elements to the Bay Bridge due to its then-proposed demolition and removal – this structure was demolished as part of the approved Transbay Program Phase 1.

- Three historic buildings at 165-173 Second Street, 191 Second Street, and 580-586 Howard Street due to their proposed demolition and removal and the resulting isolation of three other remaining buildings from the Second and Howard Historic District – this use was evaluated and approved to be undertaken as part of Phase 2 of the Transbay Program.

Eleven buildings that are contributors to the Rincon Point/South Beach District would be retained and would be underpinned to protect them from harm during construction. It was determined that no use of these properties or the District would occur. The proposed tunneling method has an extremely low

likelihood of collapse or tunnel failure. Reducing impacts on historic properties was a primary factor in the selection of this tunneling method.

The 2004 Final Section 4(f) evaluation determined that no feasible and prudent alternative existed to the use of land from the NRHP properties required for the Transbay Program, and that implementation of the Transbay Program included all possible planning to minimize harm resulting from such use (see Chapter 8 in the 2004 FEIS/EIR).

A summary of Section 4(f) properties identified in 2004 and the status of proposed use activities is shown in Table 6-1. No parklands, recreation areas, or wildlife and waterfowl refuges were identified.

Table 6-1
Status of Section 4(f) Resources Identified in 2004 FEIS Section 4(f) Evaluation

Property	NRHP Status	2004 Approved Section 4(f) Use	Current Status in 2014	Within 2014 APE?
San Francisco-Oakland Bay Bridge, a multi-component property listed on the NRHP				
425 Mission Street (Transbay Terminal)	Individually eligible and contributor	Demolition	Demolition Complete	No
Bay Bridge Approaches	Contributor	Demolition	Demolition Complete	No
Bus Ramps	Contributor	Demolition	Demolition Complete	No
Harrison Street Overcrossing	Contributor	Demolition	Demolition Complete	No
Second and Howard Streets District				
165-173 Second Street	Contributor	Demolition	Extant	No
191 Second Street	Contributor	Demolition	Extant	Yes
580-586 Howard Street	Contributor	Demolition	Extant	Yes
163 Second Street	Contributor	Adverse effect because of loss of nearby contributing building	Extant	No
577-79 Howard Street	Contributor	Isolated from District	Extant	Yes
583-87 Howard Street	Contributor	Isolated from District	Extant	Yes
589-591 Howard Street	Contributor	Isolated from District	Extant	Yes
Entire District Second and Howard Street District	NRHP Historic District	Use of District	Contributing Resources Extant	Yes
Rincon Point/South Beach Industrial Warehouse District				
35 Stanford Street	Contributor	No use	No use	No
640 Second Street	Contributor	No use	No use	No
650 Second Street	Contributor	No use	No use	No
670-680 Second Street	Contributor	No use	No use	No
301-327 Brannan Street	Contributor	No use	No use	No
130 Townsend Street	Contributor	No use	No use	No
136 Townsend Street	Contributor	No use	No use	No
144-46 Townsend Street	Contributor	No use	No use	No
148-54 Townsend Street	Contributor	No use	No use	No
162-164 Townsend Street	Contributor	No use	No use	No
166-78 Townsend Street	Contributor	Construction Easement/ Temporary Occupancy/ No use	Extant	Yes
Entire Rincon Point/South Beach Industrial Warehouse District	NRHP-Eligible Historic District; CRHR-Eligible Historic District	No use of District	No use	Yes

6.4 SECTION 4(f) EVALUATION OF THE PROPOSED PROJECT

6.4.1 Project Description

The purpose and need for the proposed project has not changed since the original Transbay Program was first defined. However, additional reasons have been identified to propose and evaluate the refinements that make up the proposed project, as summarized below. The updated purpose and need is presented in Chapter 1 of this SEIS/EIR.

Subsequent to the approval of the Transbay Program, as evaluated in the 2004 FEIS/EIR and addenda (through 2011), modifications have been identified by the TJPA in two major categories:

- refinements to the Downtown Rail Extension (DTX) primarily to comply with design specifications from the California High-Speed Rail Authority for high-speed rail (HSR) service and safety standards of the National Fire Protection Association; and

- inclusion of other transportation improvements to promote connectivity among alternative modes of transportation.

These components are briefly summarized in Table 2-3 and are shown in Figure 2-6 (see Chapter 2, Project Alternatives). Some of the improvements were analyzed previously in the 2004 FEIS/EIR and addenda (described in Section 2.1.2, Transit Center and Transportation Modifications); however, more specific locations and features of the vent shafts, for example, have been identified since that time, for consideration in this SEIS/EIR. In addition, changes to the throat structure and the train box would be required to enable HSR service. Table 6-2 compares the proposed project to the approved Transbay Program.

As described in Chapter 2, Project Alternatives, the proposed project would not change the operating plan of the DTX or Transit Center.

6.4.2 Description of Section 4(f) Properties

Historic Properties

The original Transbay Program that is being modified by the proposed project was previously reviewed under Section 106, resulting in SHPO concurrence on the finding of effect (Peninsula Corridor Joint Powers Board 2003) and resolution of adverse effects through execution of a Memorandum of Agreement (MOA) (FTA 2004). In compliance with the Section 106 MOA between the FTA and the SHPO, which was executed in 2004 and amended in 2009, the TJPA developed and implemented a series of Archaeological Research Design and Treatment Plans for the components of Phase 1 that have been or will be constructed (FTA 2004). For this SEIS/EIR, the Section 106 documentation was supplemented with updated APEs specific to the proposed project, as well as review of archival materials at the Northwest Information Center (NWIC) at Sonoma State University and the Sacred Lands File with the Native American Heritage Commission (NAHC) to identify investigations since 2004.

The updated APEs and research are detailed in the Section 106 report that was submitted to the SHPO for concurrence in September 2015; concurrence from SHPO was received on December 8, 2015. Preliminary findings of effect are summarized in Section 3.6, Cultural Resources, and detailed in Appendix G.2 of this SEIS/EIR. As shown in Table 6-1, a number of Section 4(f) properties found within the 2004 Architectural APE also are located within the updated APE. The updated APE includes portions of two historic districts listed in the NRHP and three districts eligible for NRHP listing. These districts, along with the APE and contributory buildings discussed in this chapter, are depicted in Figure 6-1.

Table 6-2
Comparison of No Action Alternative and Proposed Project Components

Approved Phase 2 Transbay Program Components (No Action Alternative)	Proposed Project
• Two-track lead on the surface and below-ground leading to the DTX tunnel system just before the underground Fourth and Townsend Street Station • Cut-and-cover Fourth and Townsend Street Station at a relatively shallow below-ground profile, with an alignment slightly skewed from Townsend Street • Three tracks beginning at the underground Fourth and Townsend Street Station and continuing to the throat section approaching the Transit Center where the three-track system splays to six tracks to accommodate the six platform berthing locations within the station • At-grade rail car storage within the existing Caltrain rail storage yard • Design provisions to allow for a future connection to the cut-and-cover tunnel on Townsend Street that will facilitate construction of future system capacity for Caltrain and HSR, and capable of accommodating construction of the Townsend/Embarcadero/Main Loop • Reconfiguration of the existing Caltrain tracks and platforms at the Fourth and King Station to be sited primarily on the south side of the railyard	• Realignment of the Fourth and Townsend Street Station and further below street level • Addition of a below-grade tunnel stub box at the west end of the railyard beneath the approved U-wall • No reconfiguration of Caltrain tracks and platforms to the south side of the railyard • Additional trackwork south of the railyard (turnback track and MOW track) within the Caltrain right-of-way along Seventh Street
• Mined tunnel from Townsend Street curvature and along Second Street	• Installation of rock dowels along portions of mined tunnel from Townsend Street curvature and along Second Street • Proposed tunneling using the Sequential Excavation Method
• Underground Transit Center train box terminates at Beale Street	• Underground Transit Center train box extended east to Main Street • Demolition of above-and below-grade podium structure at 201 Mission Street resulting in loss of parking, office, and open space • Construction of an intercity bus facility and additional office or residential development (total of four levels) above the train box extension area
• 970-foot-long curve with track curve radii of 498 to 545 feet at the throat structure entering the west side of the Transit Center under Lower Concourse; related property acquisition	• 970-foot-long curve with track curve radius of 650 feet at the throat structure entering the west side of the lower levels of the Transit Center • Additional 14,059-square-foot increase in footprint • Use of two additional parcels (235 Second Street and 589 Howard Street) • Prior demolition of building at 165-173 Second Street (current address 171 Second Street) no longer required
• 800-foot-long pedestrian connection underneath Fremont Street to the Embarcadero BART/Muni Metro Station	• 800-foot-long pedestrian connector underneath Beale Street to the Embarcadero BART/Muni Metro Station
• Assumed ventilation shafts at each end of the new Transit Center • Ventilation shafts with emergency exits along Main Street, just north of Harrison Street • No ventilation shafts at the Townsend Station	• Revised and proposed additional locations for vent structures: – At the new Transit Center: one vent structure/cooling tower and two exhaust fans at the west end and one vent structure at the east end – At the Fourth and Townsend Street Station: one at each end

Table 6-2
Comparison of No Action Alternative and Proposed Project Components

Approved Phase 2 Transbay Program Components (No Action Alternative)	Proposed Project
• Emergency exit shafts at Second and Brannan Streets, and Second and Howard Streets	– One vent structure each at Third and Townsend Streets and at Second and Harrison Streets
• No taxi staging	• Addition of a taxi staging area at curbside along portions of Minna and New Natoma Streets
• Bus ramp	• No change to bus ramp • Addition of bicycle/controlled vehicle ramp from Howard Street leading to Lower Concourse level • Below-grade bicycle storage facility for up to 1,000 bicycles
• No use of facilities for off-hours/nighttime or event parking	• Use AC Transit bus storage facility parking for off-hours/ nighttime or event parking (202 valet parked or 167 self-parked spaces)
• Operations – Multi-modal Transit Center (serving rail, bus, shuttle, taxi, bicycle, pedestrian), DTX	• No change
Source: Compiled by AECOM in 2015	

Historic Architectural Resources

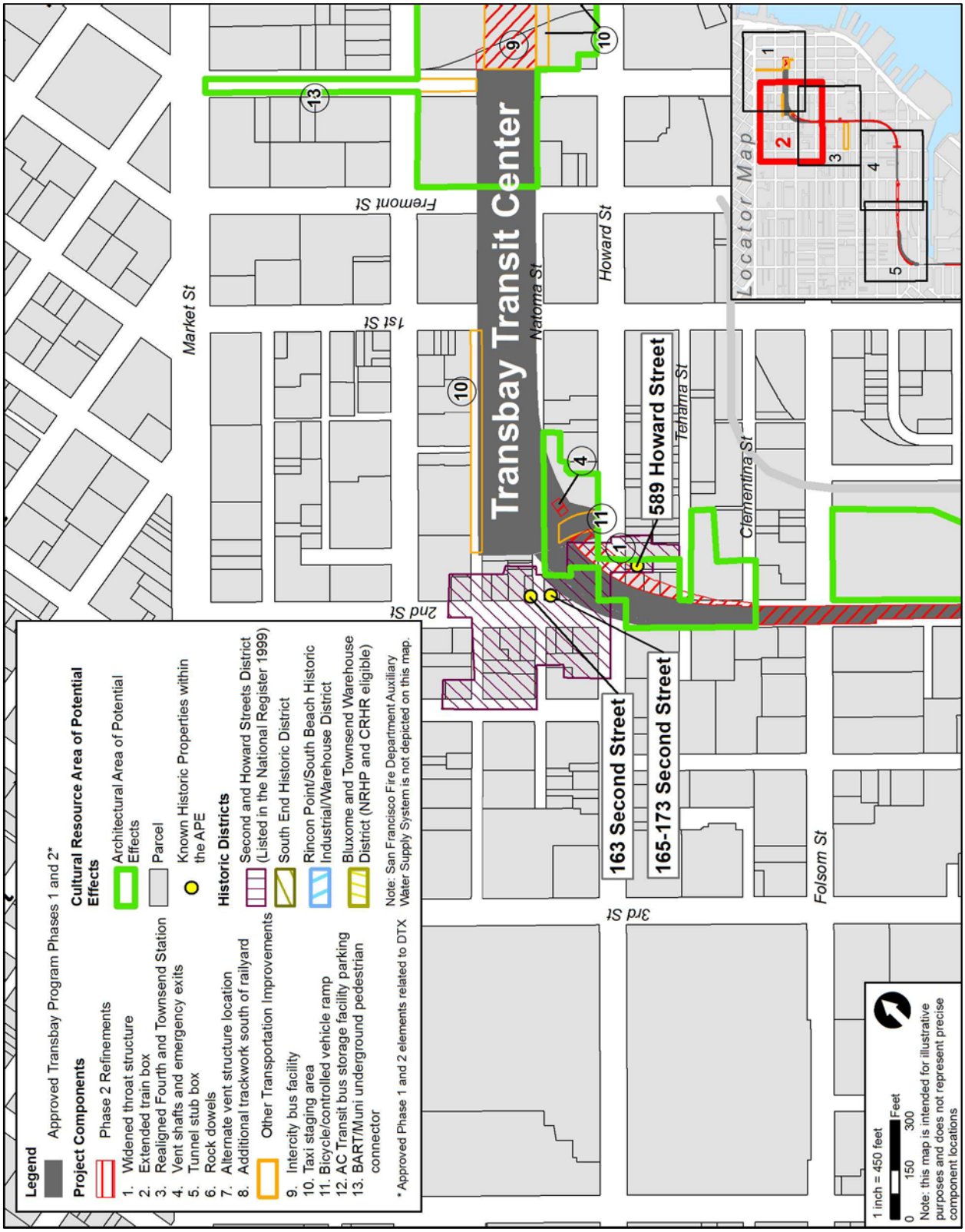
There are no historic properties within the proposed project Architectural APE that are listed or eligible for listing in the NRHP and therefore qualify as Section 4(f) resources; there are individual buildings that are identified as contributors to the five historic districts in the Architectural APE, but they are not eligible individually. Table 6-3 summarizes the historic districts within the proposed project architectural APE that are listed or eligible for listing in the NRHP and therefore qualify as Section 4(f) resources. For the purposes of Section 4(f) evaluation, this section focuses on additional Section 4(f) effects beyond those described in the 2004 FEIS.

Second and Howard Streets NRHP Historic District

The Second and Howard Streets Historic District was listed in the NRHP in 1999 (Bloomfield 1998). The district consists of 19 contributing properties on Second, Howard, Natoma, and New Montgomery Streets, and three non-contributors on Second Street. The district was listed in the NRHP at the local level of significance for its architectural significance (NRHP Criterion C) within the context of San Francisco's rebuilding after the 1906 earthquake and fire. All of the contributing properties were constructed between 1906 and 1912, the district's period of significance. The contributing properties are commercial-style buildings with Renaissance-Baroque ornamentation (Bloomfield 1998).

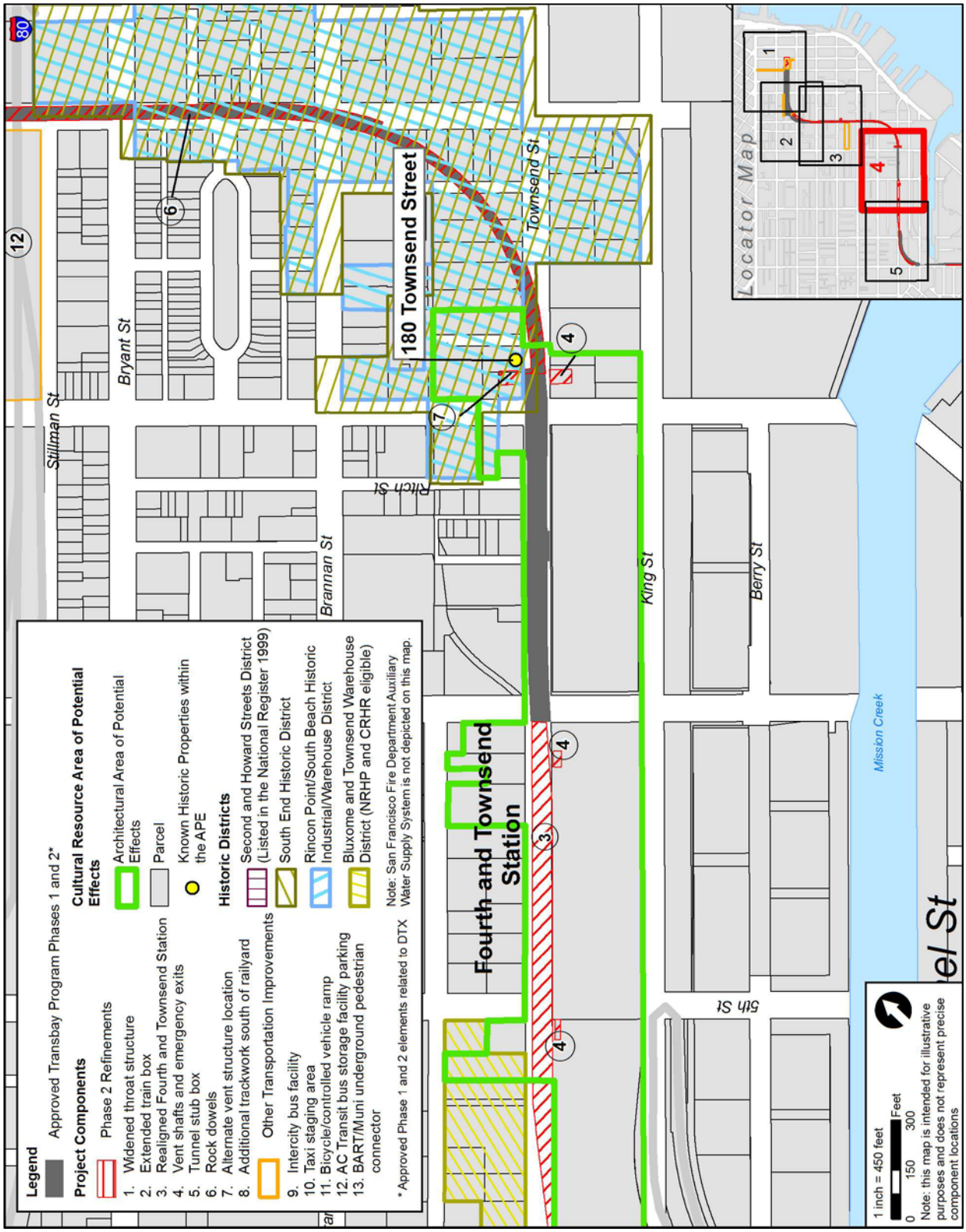
Rincon Point/South Beach Historic Warehouse-Industrial District

The Rincon Point/South Beach Historic Warehouse-Industrial District was identified and designated in 1983 by the California Department of Transportation (Caltrans) for the Interstate 280 Transfer Concept Project (Caltrans 1983). This area of San Francisco was developed beginning in the 1850s and 1860s after landfill and warehouse construction changed the physical appearance of the waterfront. The district was identified by Caltrans historians as appearing eligible for the NRHP. The research found that the district appeared eligible under all four NRHP criteria. Approximately 60 buildings within the district were identified as contributing to the district's significance. The Rincon Point/South Beach Historic Warehouse Industrial District was designated as locally significant and determined eligible for listing in the CRHR.



Sources: City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 6-1a Section 4(f) Historic Resources (NRHP-Eligible Historic Districts and Contributory Buildings Potentially Affected)



Sources: City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 6-1b Section 4(f) Historic Resources (NRHP-Eligible Historic Districts and Contributory Buildings Potentially Affected)

Table 6-3
Historic Districts within the Proposed Project Architectural APE Listed in, or Determined or Recommended Eligible for, the National Register of Historic Places

Historic District Name	Eligibility Status
Second and Howard Streets Historic District	NRHP Historic District
Rincon Point/South Beach Historic Warehouse-Industrial District	NRHP-Eligible Historic District; CRHR-Eligible Historic District
South End Historic District	San Francisco Article 10 Historic District; NRHP-Eligible Historic District
Bluxome and Townsend Warehouse District	NRHP-Eligible Historic District; CRHR-Eligible Historic District
San Francisco Fire Department Auxiliary Water Supply System	NRHP Historic District; CRHR Historic District
Source: Compiled by AECOM in 2014	

South End Historic District

In 1990, the City established an Article 10 district called the South End Historic District (City of San Francisco 1990). In October 2008, the district was certified by the Secretary of the Interior for the purposes of the Tax Reform Act of 1986, as eligible for the NRHP (Lapsley 2008). When it was determined eligible the district included 55 contributing buildings, primarily light industrial buildings and warehouses, and 23 non-contributing buildings. The boundaries were originally defined by Bryant, First, King, and Third Streets. In 2010, the boundaries were expanded on the eastern border to incorporate an additional 12 contributing properties. The boundaries of the South End Historic District are nearly identical to the Rincon Point/South Beach Historic Warehouse-Industrial District.

Bluxome and Townsend Warehouse District

A portion of the Bluxome and Townsend Warehouse District is located within the APE. This district appears eligible for the NRHP under Criterion A and C and has nine contributing buildings within its boundaries. The period of significance for the district is 1912 to 1936. The district is industrial in character and ornamentation reflects the Classical Revival, Spanish Revival, and Art Deco architectural styles. The district appears significant for its association with an important trend in development patterns in San Francisco, and as a representation of a group of properties that embody the distinctive characteristics of a type, period, or method of construction (Page & Turnbull 2009). The district appears to remain eligible for the NRHP.

San Francisco Fire Department Auxiliary Water Supply System

The San Francisco Fire Department Auxiliary Water Supply System (AWSS) is a discontiguous historic district composed of one reservoir, two storage tanks, two pump stations, 172 cisterns, approximately 135 miles of pipe, 52 suction connections located along the northeastern waterfront, two fire boats, 1,600 hydrants, and 3,828 valves. The AWSS was determined to be eligible for listing in the NRHP and CRHR in 2009 (Mates 2009). The AWSS was determined to be eligible under Criteria A/1 for its association with the 1906 earthquake and the period of rebuilding and reconstruction after the earthquake and fires. The AWSS is significant under Criteria C/3 as an innovative design of a water-supply system during post-earthquake reconstruction. The period of significance for the district under Criteria A/1 is 1908 through 1913. The period of significance under Criteria C/3 is 1908 through 1964. The elements that form the AWSS are the reservoir, tanks, pumps, pipes, hydrants, cisterns, and gate valve houses. The district boundaries are the footprint of the pipes, tunnels, buildings, and structures. The San Francisco AWSS was transferred to the San Francisco Public Utilities Commission, effective 2010.

Archeological Resources

No known Section 4(f) archaeological resources are within the proposed project footprint or Archeological APE; therefore, none would be affected or used. For further information, see Section 3.6, Historic and Cultural Resources, and Appendix G.2 of this SEIS/EIR.

Publicly Owned Public Parks and Recreational Areas

Eligible parks and recreation areas must be open to the entire public during its hours of operation. Recreational areas include publicly-owned formal and informal facilities, including after-school public use of school playgrounds and recreational facilities. For the purposes of this evaluation, all publicly-owned parks and recreation areas are presumed to be significant and have been regarded as a Section 4(f) property. Public parks and recreation areas within 0.25 mile of the proposed project are identified here. This "buffer" distance would adequately encompass use, temporary use, and constructive use.

Section 4(f) park properties within 0.25 mile of the proposed project area are summarized in Table 6-4 and shown earlier in Figure 3.15-1 in Section 3.15, Public Services, Community Services, and Recreational Facilities. A description of these park and recreation area properties is provided below by the official with jurisdiction.

San Francisco Recreation and Parks Department

The San Francisco Recreation and Parks Department (SFRP) owns and manages more than 3,300 acres of open space in the city. The combined City, state, and federal property permanently dedicated to open space totals approximately 4,090 acres. In the proposed project area, the SFRP-owned parks include facilities along the Embarcadero waterfront and one neighborhood park.

Port of San Francisco

The Port of San Francisco (Port) has jurisdiction over more than 1,000 acres of waterfront. Although the Port is a department of the City and County of San Francisco, the Port relies almost solely on the leasing of Port property for its revenues. The proposed project is within 0.25 mile of some Port facilities along The Embarcadero and in the China Basin neighborhood.

San Francisco Department of Public Works

The San Francisco Department of Public Works (DPW) is responsible for the care and maintenance of San Francisco's streets and much of its infrastructure. The DPW plants and maintains trees and constructs and maintains City-owned facilities. The DPW is responsible for the Street Parks Program to develop community-managed gardens; two street parks fall within the proposed project area. In addition, the DPW manages one plaza in the proposed project area.

San Francisco Office of Community Investment and Infrastructure

The City created the OCII as the successor agency to the San Francisco Redevelopment Agency (SFRA) that was dissolved in 2012. Its mission is to provide funding for affordable housing, economic development, and improvement of quality of life. A number of legacy SFRA project sites are located within the proposed project area, including the active redevelopment of Rincon Point/South Beach, South of Market Area, and Mission Bay North and South.

Wildlife or Waterfowl Refuges

As discussed in Section 3.3, Land Use and Planning, Wind, and Shadow, and Section 3.7, Biological Resources, no designated wildlife or waterfowl refuges are located in the proposed project area.

Table 6-4
Publically-Owned Parklands within 0.25 Mile of the Proposed Project Area

Parkland	Type	Official with Jurisdiction	Nearest Project Feature
AT&T Park	Baseball Park	Port of San Francisco	Vent Structure
China Basin Park	Park	Port of San Francisco	Vent Structure
Ferry Plaza	Plaza	Port of San Francisco	Extended Train Box
Giants Promenade	Promenade	Port of San Francisco	Rock Dowel
Harry Bridge's Plaza	Plaza	Port of San Francisco	Extended Train Box
Herb Caen Way	Promenade	Port of San Francisco	Rock Dowels
Mission Creek Garden	Park	Port of San Francisco	Vent Structure, Realigned Fourth and Townsend Street Station
Pier 14	Pier/Promenade	Port of San Francisco	Extended Train Box
Rincon Park	Park/Promenade	Port of San Francisco	Extended Train Box, Taxi Staging Area
South Beach Park	Park/Promenade	Port of San Francisco	Vent Structure, Rock Dowels
Willie Mays Plaza	Plaza	Port of San Francisco	Vent Structure
Street Park: Annie Street	Promenade	San Francisco (SF) Department of Public Works	Taxi Staging Area, Widened Throat Structure, Bicycle and Controlled Vehicle Ramp
Street Park: Ecker Street	Promenade	SF Department of Public Works	Taxi Staging Area, Widened Throat Structure, Bicycle/Vehicle Ramp
Market/Battery Plaza	Plaza	SF Department of Public Works	BART/MUNI Underground Pedestrian Connector
Yerba Buena Gardens	Park	SF Office of Community Investment and Infrastructure	Rock Dowels, Widened Throat Structure
5th Street Plaza and Promenade	Plaza/Promenade	SF Office of Community Investment and Infrastructure	Vent Structure, Realigned Fourth and Townsend Street Station
Gap Building	Plaza	SF Office of Community Investment and Infrastructure	Extended Train Box, Taxi Staging Area
Jessie Street Plaza (Jewish Museum)	Plaza	SF Office of Community Investment and Infrastructure	Widened Throat Structure
Rincon Center	Mixed Use/Plaza	SF Office of Community Investment and Infrastructure	Extended Train Box
Yerba Buena Center	Plaza/Arts Center/ Museum	SF Office of Community Investment and Infrastructure	Rock Dowels, Widened Throat Structure, AC Transit Bus Storage Facility Parking
Mission Bay Park	Park/Promenade	SF Office of Community Investment and Infrastructure	Tunnel Stub Box, Vent Structure, Realigned Fourth and Townsend Street Station
Justin Herman/ Embarcadero Plaza[1]	Plaza	SF Recreation and Parks	Extended Train Box, BART/MUNI Underground Pedestrian Connector
Maritime Plaza[1]	Plaza	SF Recreation and Parks	BART/MUNI Underground Pedestrian Connector
South Park[1]	Park	SF Recreation and Parks	Rock Dowels
Esprit Park[1]	Park	SF Recreation and Parks	Additional trackwork south of the Caltrain railyard
Sue Bierman Park/Ferry Park[1]	Park	SF Recreation and Parks	BART/MUNI Underground Pedestrian Connector

Note:
[1] property is recognized as a park land by the San Francisco Recreation and Parks Department
Source: City and County of San Francisco 2013

6.4.3 Use of Section 4(f) Properties

As previously defined, use of Section 4(f) property is defined in 23 CFR Part 774.17 and occurs when:

- Land is permanently incorporated into a transportation facility;
- There is a temporary occupancy of land that is adverse in terms of the Section 4(f) statute's preservationist purposes; or
- There is a constructive use of a Section 4(f) property.

After taking into account the incorporation of any measures to minimize harm, if the net impact of a permanent incorporation or temporary occupancy use results in either a Section 106 finding of no adverse effect or no historic properties affected on a historic property, FTA has received written concurrence from the official(s) with jurisdiction over the property (e.g., the SHPO) and has taken into account the views of consulting parties to the Section 106 process as required by 36 CFR Part 800, then a de minimis impact determination may be made. Section 4(f) properties with proposed changes in use from the 2004 FEIS/EIR, or a newly identified use, are considered for further discussion and are summarized in Table 6-5.

180 Townsend, Rincon Point/South Beach District and South End Historic District

Description of Effect. The alternate location considered for a vent structure at Third Street and Townsend Street would require the demolition of buildings located within the South End Historic District and Rincon Point/South Beach Historic Industrial Warehouse District. Of the two buildings that would be demolished, 180 Townsend is considered to be a contributor to the South End Historic District. The building located at 689–699 Third Street was identified as a non-contributor to the South End Historic District in the National Register Certification prepared by Page & Turnbull and certified by the National Park Service in 2008 (Lapsley 2008; Page & Turnbull 2010).

As discussed further in Appendix G.2 of this SEIS/EIR, the demolition of one contributor and one non-contributor would not result in a substantial impact on the South End Historic District because the historical integrity of the district would remain strong as a whole, with 55 remaining contributors and with the retention of a strong row of contributing buildings east of 180 Townsend to Second Street. Mitigation Measure CH 12, previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project, would continue to apply and would be amended to include the documentation of 180 Townsend before its demolition. The introduction of the vent structure at this corner location at the edge of the historic district could result in an adverse effect, unless the new design follows accepted preservation standards for context-sensitive infill development in historic districts, such as the Secretary of the Interior's Standards for the Treatment of Historic Properties. The TJPA would require the new design to follow the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Preliminary Section 4(f) Use Determination. The proposed alternate location for a vent structure at the northeast corner of Third and Townsend Streets would require the demolition of 180 Townsend Street, a contributor to the Rincon Point/South Beach and South End Historic District, a historic property for the purposes of the National Historic Preservation Act (NHPA). However, Mitigation Measures CH 11, CH 12, and CH 13, previously approved from the 2004 FEIS/EIR and incorporated into the project, would reduce this effect, and the effects determination reached in the 2004 FEIS/EIR would not change. When considering a historic district, the integrity of the district as a whole is considered paramount to the individual integrity of any one component, and in some cases, actions that would result in an impairment of the integrity of an individual building or structure may not be considered actions that would impair the

Table 6-5
Summary of Section 4(f) Properties with New or Changed Use for the Proposed Project

Section 4(f) Resource	Contributing Element	NRHP Status	Approved 2004 Use	Proposed 2014 Activity	2014 Preliminary Use Determination
Rincon Point/South Beach District and South End Historic District	180 Townsend Street	3D	No Use	Demolition	De minimis
Second and Howard Street District	165-173 Second Street	1D	Demolition	Piles and Underpinning	De minimis
	589–591 Howard Street	1D	Isolated from District	Piles and Underpinning	De minimis
	163 Second Street	1D	Use (Adverse effect because of loss of nearby contributing building)	No adverse effect, nearby contributing building to be preserved	No use
Bluxome and Townsend Warehouse District		NRHP-Eligible Historic District	None; Historic District identified after 2004	No adverse effect, all project components are outside the boundaries of the district	No use
San Francisco Fire Department Auxiliary Water Supply System		NRHP Historic District	Not Discussed (within 2004 APE Area)	Pipe Replacement	De minimis

Notes:
California Register of Historical Resources (CRHR) Status Codes are as follows:
1D Contributor to a district or multiple resource property listed in the NRHP by the Keeper. Listed in the CRHR.
3D Appears eligible for NRHP as a contributor to a NRHP-eligible district through survey evaluation.
Source: Compiled by AECOM in 2015

integrity of a historic district. The demolition of one contributor would not result in an adverse effect on the Rincon Point/South Beach and South End Historic District, because the historical integrity of the district would remain strong as a whole, with 54 remaining contributors and with the retention of a strong row of contributing buildings to the east of 180 Townsend to Second Street. Based on the minor effect of the loss of one contributing building in a historic district made up of more than 55 contributors, and the application of mitigation measures, the FTA's preliminary determination is that the proposed project would result in no adverse effect to the Rincon Point/South Beach and South End Historic Districts. Therefore, the demolition of 180 Townsend Street would not affect the features and attributes that qualify the Historic District for protection under Section 4(f) and the preliminary determination is that a de minimis impact finding for the proposed project on the historic Rincon Point/South Beach and South End Historic Districts would be appropriate. On completion of Section 106 consultation, a final determination of the proposed project's potential use of this Section 4(f) historic district will be made.

If the SHPO, as the official with jurisdiction over the Rincon Point/South Beach and South End Historic Districts and 180 Townsend Street, does not agree with a de minimis impact determination, an analysis of avoidance alternatives must be conducted. If the analysis concludes that there is no feasible and prudent alternative to use of this Section 4(f) property, FTA may only approve the alternative that causes the least overall harm. A least overall harm analysis would be conducted to determine which alternative may proceed.

589 Howard Street, Second and Howard Street Historic District

Description of Effect. The proposed widened throat structure has the potential to directly affect historic architectural resources where cut-and-cover construction activities extend farther east than the construction activities evaluated in the 2004 FEIS/EIR. This shift and expansion of the throat structure at the west end of the train box also would have the potential to cause vibration impacts on buildings that were previously farther removed from those construction activities.

The additional area of the widened throat structure would extend underneath portions of the five-story building at 589 Howard Street, a contributor to the Second and Howard Streets Historic District. The character-defining features of the building include the brick cladding, restrained brick ornamentation, and rhythmic fenestration pattern of the Howard Street facade. The impact on this structure that was recognized in the 2004 FEIS/EIR was limited to the recognition that after the three buildings north of 589 Howard Street are demolished, 589 Howard Street would be visually isolated from the rest of the Second and Howard Streets Historic District. The 2007 revisions to the Mitigation Monitoring and Reporting Program (MMRP) (TJPA 2007), provided in Appendix C of this SEIS/EIR, recognized the potential for construction-related damage as well, and 589 Howard Street was added to the properties covered by Mitigation Measure CH 11, which specifies protective measures to be implemented, monitored, and supplemented as needed. However, the widened throat structure would pass under a portion of 589 Howard Street. To address this situation, two construction options were evaluated: (1) installing large-diameter piles and then an underpinning beam in the existing basement to support the building above, and (2) demolishing the northwest portion of the building and then restoring the building after construction of the throat structure.

To avoid demolishing the northwest portion of the building, the piles and underpinning option were selected for the proposed project. This preferred approach would use a portion of this historic property by demolishing the basement space below the sidewalk on the north side of the building. Two large-diameter cast-in-drilled-hole piles would be installed on the north and west sides of the building. A beam would be inserted to span the piles, and the piles and the underpinning beam would support the building during construction. With the addition of underpinning, the construction-induced vibration would have a very low potential to cause structural damage to 589 Howard Street.

Previously approved mitigation measures that are incorporated into the proposed project would reduce the effects to this Section 4(f) property. Mitigation Measures CH 11 and CH 13 would continue to apply and would be implemented and monitored for the proposed project. Mitigation Measure CH 11 specifies protective measures to be developed, implemented, monitored, and supplemented where necessary, and Mitigation Measure CH 13 specifies standards and procedures for repairing inadvertent damage caused by the proposed project. In addition, mitigation measures previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project for geology, soils, and seismicity (SG 1, SG 2, SG 4, and SG 5) and for vibration control during construction (VibC 1, VibC 2, and VibC 3) would further reduce potential effects associated with construction activities at and around 589 Howard Street. The full text for these measures is provided in Appendix C of this SEIS/EIR. Furthermore, as described under Impact C-NO-4 in Section 3.12, Noise and Vibration, construction vibration impacts of the proposed project could be mitigated by amending the 2004 FEIS/EIR mitigation measures to acknowledge historical resources.

Preliminary Section 4(f) Use Determination. The proposed widened throat structure would require underpinnings designed to protect the building's structural integrity during construction, which would result in the use of the historic 589 Howard Street building. A possibility would exist of unanticipated damage to the building during construction of the underpinnings. Any such damage could affect the integrity of the historic structure. Mitigation Measures CH 11, CH 12, and CH 13, previously approved

from the 2004 FEIS/EIR and incorporated into the proposed project, would reduce this effect, and the effects determination reached in the 2004 FEIS/EIR would not change. With implementation of these previously adopted mitigation measures, the FTA's preliminary determination is that the proposed project would not affect the character-defining features of the building at 589 Howard Street and would therefore have no adverse effect on 589 Howard Street or the Second and Howard Street Historic District. Therefore, a de minimis impact finding for the proposed project on this Section 4(f) historic district would be appropriate. On completion of Section 106 consultation, a final determination of the proposed project's potential use of the Section 4(f) Second and Howard Street Historic District will be made.

If the SHPO, as the official with jurisdiction over the Second and Howard Streets Historic District and 589 Howard Street, does not agree with a de minimis impact determination, an analysis of avoidance alternatives must be conducted. If the analysis concludes that there is no feasible and prudent alternative to use of this Section 4(f) property, FTA may only approve the alternative that causes the least overall harm. A least overall harm analysis would be conducted to determine which alternative may proceed.

165-173 Second Street, Second and Howard Streets Historic District

Description of Effect. The building at 165-173 Second Street is a contributor to the Second and Howard Streets District. The character-defining features of the building are the brick cladding, heavy cornice, and rhythmic fenestration pattern of the Howard Street facade. 165-173 Second Street was identified for demolition in the 2004 FEIS/EIR. With the shift of the location of the widened throat structure under the proposed project, it is no longer necessary to demolish the building and the prior SHPO determination of a direct adverse effect on the historic district to which this property contributes can be amended to not adverse with mitigation measures recommended in the Section 106 documentation submitted by the FTA to the SHPO. The proposed project would implement construction methods for 165-173 Second Street similar to those identified above for 589 Howard Street, which would consist of underpinning the building to support the structure during construction. Similar to the previous discussion of 589 Howard Street, the proposed project would result in use of a portion of this Section 4(f) property, and implementation of the same previously adopted mitigation measures would result in a SHPO determination that the effects on the building and the historic districts would not be adverse.

Preliminary Section 4(f) Use Determination. The use of the historic 165-173 Second Street building would be reduced from demolition of the entire property to construction of underpinnings designed to protect the building's structural integrity. A possibility of unanticipated damage would exist to the building during construction of the underpinnings. Any such damage could affect the integrity of the historic structure. Mitigation Measures CH 11, CH 12, and CH 13, previously approved from the 2004 FEIS/EIR and incorporated into the proposed project, would reduce this adverse effect. In addition, mitigation measures previously identified in the 2004 FEIS/EIR and adopted and incorporated into the proposed project for geology, soils, and seismicity (SG 1, SG 2, SG 4, and SG 5) and for vibration control during construction (VibC 1, VibC 2, and VibC 3) would further reduce potential adverse effects associated with construction activities at and around 165-173 Second Street. With application of mitigation measures, the FTA's preliminary determination is that the proposed project would not affect the character-defining features of the building at 165-173 Second Street and would have no effect on 165-173 Second Street or the Second and Howard Street District. Therefore, a de minimis impact finding for the proposed project on these Section 4(f) historic resource and districts would be appropriate. On completion of Section 106 consultation, a final determination of the proposed project's potential use of the Section 4(f) historic property and districts will be made.

If the SHPO, as the official with jurisdiction over the Second and Howard Streets Historic District and 165-173 Second Street, does not agree with a de minimis impact determination, an analysis of avoidance alternatives must be conducted. If the analysis concludes that there is no feasible and prudent alternative

to use of this Section 4(f) property, FTA may only approve the alternative that causes the least overall harm. A least overall harm analysis would be conducted to determine which alternative may proceed.

163 Second Street, Second and Howard Streets Historic District

Description of Effect. The 2004 FEIS/EIR identified that the Transbay Program would include a Section 4(f) use of 163 Second Street, a contributor to the Second and Howard Streets Historic District. Specifically, the building at 163 Second Street would experience an indirect adverse effect because of the change in setting associated with the proposed demolition and loss of a nearby contributing building, 165-173 Second Street. However, because the proposed project would no longer include demolition of the 165-173 Second Street historic property, the indirect adverse effect on 163 Second Street would be avoided.

Preliminary Section 4(f) Use Determination. The proposed widened throat structure would allow 165-173 Second Street to remain extant and would result in a beneficial change in use as a result of the proposed project. There would be no change in the setting of 163 Second Street and the FTA's preliminary determination is that the proposed project would have no effect on 163 Second Street and the Second and Howard Streets District. No Section 4(f) use would occur.

Bluxome and Townsend Historic District

Description of Effect. The 2004 FEIS/EIR did not discuss this historic district, because it was not identified as eligible for the NRHP until 2009. The NRHP-eligible Bluxome and Townsend Warehouse Historic District is located to the northwest of the proposed realigned Fourth and Townsend Street Station, which would be underground beneath Townsend Street. This proposed project component would not impede sight lines from the historic district to the railyard, and would not indirectly impact the historic districts, because it would be underground. Construction of the proposed entrances and vent structures at the station, which would be above-ground features, would not substantially alter the relationship between the buildings of the district and the rail tracks—a relationship that, in part, helps to define the historic district's significance—because the new structures would be constructed at a sufficient distance from the district. The nearest vent structure to the district would be the one at the west end of the station, or approximately 100 feet away. The vent structure also would be relatively small in size (approximately 35 feet by 35 feet), based on the vent structure plans at Third and Townsend Streets which are expected to be similar to the vent structure at the Fourth and Townsend Street Station. For these reasons, the vent structures would not impede sight lines from the historic district to the railyard. Therefore, construction of the proposed vent structures would not constitute an indirect adverse effect on the Bluxome and Townsend Warehouse Historic District.

Preliminary Section 4(f) Use Determination. None of the proposed project components would be constructed within the boundaries of the Bluxome and Townsend Historic District. In addition, the proposed project would not require temporary or permanent easements within the Historic District. Therefore, no Section 4(f) use would occur. Furthermore, the proposed project would have no adverse effect on the Bluxome and Townsend Historic District, because because alteration of the district's setting from the Fourth and Townsend Street Station entrances and vent structures would not impair the Historic District's ability to convey its historical significance or eligibility status. Therefore, the proximity impacts from construction and operation of the proposed project would not substantially impair the features of the property that qualify it for protection under Section 4(f), and the proposed project would not result in constructive use the Historic District.

San Francisco Fire Department Auxiliary Water Supply System

Description of Effect. The proposed project could affect the San Francisco Fire Department AWSS, a NHPA historic district, in the following locations:

- The widened throat structure, located underground at the intersection of Second and Howard Streets, could affect an 18-inch-diameter pipe running underneath Second Street and a 12-inch-diameter pipe underneath Howard Street. According to the Second Street Utility Relocation Details drawing (Parsons Transportation Group 2010), the 18-inch-diameter pipe underneath Second Street would be taken out of service temporarily and would be replaced with a new 18-inch-diameter pipe at the completion of the DTX project. The 12-inch-diameter pipe underneath Howard Street would be taken out of service temporarily.

- The extended train box could affect portions of the AWSS that run along Main Street. This proposed project component would extend eastward, from Beale Street to Main Street, and potentially could replace portions of the San Francisco Fire Department AWSS located in this area around and along Main Street.

- The BART/Muni underground pedestrian connector could affect portions of the AWSS that run along Beale Street. This proposed project component would be approximately 800 feet long.

Because approximately 135 miles of pipes are in the AWSS historic district, replacement of a relatively small segment of pipe and taking another segment out of service (together totaling less than 1 mile) would not affect the character-defining features of the historic district because the removal and replacement of the pipes would not impair the district's ability to convey its historical significance, nor would it alter the district's eligibility status. Furthermore, before any disturbance to the AWSS, TJPA would coordinate with SFPUC, the official agency with jurisdiction. Therefore, the FTA's preliminary determination is that the proposed project would have no adverse effect on the AWSS Historic District. The SFPUC would provide the proper guidance for maintaining the resource through design guidelines and/or leave and protect in-place methods. Written and documented consultation with the SFPUC would be required before the disturbance of AWSS facilities.

Preliminary Section 4(f) Use Determination. The proposed project would have no adverse effect on the San Francisco Fire Department AWSS because alteration of a small number of pipe structures would not impair the district's ability to convey its historical significance or eligibility status. Therefore, a de minimis impact finding for the proposed project on this historic district would be appropriate. On completion of Section 106 consultation, a final determination of the proposed project's potential use of this Section 4(f) historic district will be made.

If the SHPO, as the official with jurisdiction over the San Francisco Fire Department Auxiliary Water Supply System, does not agree with a de minimis impact determination, an analysis of avoidance alternatives must be conducted. If the analysis concludes that there is no feasible and prudent alternative to use of this Section 4(f) property, FTA may only approve the alternative that causes the least overall harm. A least overall harm analysis would be conducted to determine which alternative may proceed.

Unknown Archeological Resources

Description of Effect. Potential adverse effects on unknown archaeological resources are similar to previous activities evaluated in the 2004 FEIS/EIR: no new or substantially more severe significant impacts have been identified or are anticipated to be identified, nor would these elements substantially change the severity or significance of the environmental impacts disclosed in the 2004 FEIS/EIR.

Nonetheless, further discussions of potential unanticipated discoveries and the applicability of Section 4(f) regulations are provided below for informational purposes.

Construction of the proposed project would disturb sediments to considerable depths below the modern surface, and post-review discovery of archaeological resources has the potential to occur. Archeological sites on or eligible for inclusion on the National Register, including those discovered during construction, may require an expedited Section 4(f) review process. This would include evaluation of feasible and prudent avoidance alternatives, taking into account the level of investment already made, and notification and shortened consultation with other agencies as appropriate. If subsequent Section 106 consultation identifies an adverse effect, this would be considered a Section 4(f) use.

However, archeological resources are exempt from the Section 4(f) approval process when:

- The archeological resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. This includes situations where data recovery is undertaken or, with agreement of the official(s) with jurisdiction, the decision is made not to recover the resource; and

- The official(s) with jurisdiction over the Section 4(f) resource have been consulted and have not objected to the above determination.

Discoveries are, in part, also addressed before construction in agreement documents that set forth procedures that plan for subsequent discoveries. In signing a Memorandum of Agreement (MOA), SHPO delineates specific SHPO-approved procedures that would be implemented in the case of any unanticipated discovery. In addition, through the Section 106 consultation process, SHPO confirms its agreement with mitigation measures proposed to address adverse effects under Section 106 of the NHPA.

Preliminary Section 4(f) Use Determination. Because no formal determination of eligibility of unknown resource can be made, any discovery would need subsequent evaluation by the FTA, officials with jurisdiction and other consulting parties. Therefore, no Section 4(f) use determination can be made at this time.

Publicly Owned Public Parks, Recreational Areas, or Wildlife or Waterfowl Refuges

Description of Effect. As described in Section 3.15, Public Services, Community Services, and Recreational Facilities, construction of the proposed project would result in street closures, detours, and construction staging activities that could restrict access to publicly-owned parks and recreational areas in the proposed project area. Similarly, construction activities would generate noise and dust that could disrupt activities in parks that could impair the activities, features, or attributes of the recreational facilities if such activities were to occur in close proximity to parks.

South Park, the nearest public park owned and maintained by the City Department of Recreation and Parks, is set back approximately 150 feet from the construction area and would be accessible from other streets. Furthermore, heavy construction equipment would not be expected in the stretch where access to the park from Second Street exists, because construction for the DTX in this segment of Second Street would include mining and not the more disruptive cut-and-cover construction method. Although noise and dust may be noticeable in other areas of above-ground construction, mitigation adopted from the 2004 FEIS/EIR and incorporated into the Transbay Program would apply to the proposed project and would allow continued use of parks. Consequently, the proximity of construction activities would not impair the activities, features, or attributes of South Park or other nearby parks.

No wildlife or waterfowl refuges are in the project vicinity, and thus no effects on these Section 4(f) properties would occur.

Section 4(f) Use Determination. No permanent incorporation, adverse temporary occupancy, or constructive use of park, recreation, or wildlife refuge properties would occur. No Section 4(f) use of publicly owned public parks, recreational areas, or wildlife or waterfowl refuges would occur.

6.5 FTA USE DETERMINATION

As described above in Section 6.4.3, the proposed project would result in use of the following Section 4(f) resources:

- 180 Townsend, a contributor to the South End Historic District
- 589 Howard Street, a contributor to the Second and Howard Streets Historic District
- 165-173 Second Street, a contributor to the Second and Howard Streets District
- 163 Second Street, a contributor to the Second and Howard Streets Historic District
- The San Francisco Fire Department AWSS

However, impacts associated with the proposed project would not adversely affect the activities, features, and attributes that qualify these properties for protection under Section 4(f). Therefore, as also described above, after considering measures to minimize harm, the preliminary determinations are that impacts associated with use of each of these Section 4(f) resources would be de minimis.

6.6 AVOIDANCE ALTERNATIVES

The preliminary determination in the above evaluation is that the proposed project would result in a de minimis impact finding on Section 4(f) properties. Pursuant to 23 CFR Part 774(b), if impacts to Section 4(f) resources are determined to be de minimis, a discussion of avoidance alternatives is not required.

6.7 COORDINATION

As described above, subsequent to the certification of the 2004 FEIS/EIR, the FTA and the SHPO executed an MOA regarding the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, which was amended in 2009. Consultation with the SHPO for supplemental Section 106 studies for the proposed project began in July 2015, with a letter from FTA to the SHPO asking for concurrence on the APE Amendment and Supplemental Section 106 report. In addition to the updated APEs specific to the proposed project, background and archival materials from the NWIC at Sonoma State University and the Sacred Lands File with the NAHC were documented to identify investigations in the study area that occurred after 2004. The updated APEs and research are detailed in the Section 106 report that was submitted to the SHPO for concurrence in September 2015; concurrence was received from SHPO on December 8, 2015. Preliminary findings of effect are documented in Appendix G.2 of this SEIS/EIR.

Consistent with 49 USC 303, copies of this Draft Section 4(f) evaluation will be made available as part of this SEIS/EIR to officials/agencies with jurisdiction over the identified Section 4(f) resources (including the SHPO), other appropriate parties, and the public for a an approximately 60-day comment period. The TJPA and FTA will continue to consult with affected agencies regarding the effects of the project on the features and attributes of Section 4(f) properties, and provide opportunity for public comment. A final Section 4(f) evaluation and FTA's Section 4(f) determination will be part of its Record of Decision (ROD).

CHAPTER 7 COORDINATION AND CONSULTATION

7.1 INTRODUCTION

The agency coordination and community outreach efforts for the Draft Supplemental EIS/EIR (SEIS/EIR) for the Transbay Program were developed and implemented to receive public input from affected citizens, key stakeholders, and regulatory agencies. The outreach program was designed to reach stakeholders, property owners, policy makers, and the general public, especially those living and/or working along the approved Transbay Program alignment and in the immediate vicinity of proposed project improvements, as described in Chapter 2, Project Alternatives.

This chapter describes the public outreach, agency coordination consultation conducted by the Transbay Joint Powers Authority (TJPA), the lead local agency, along with the Federal Transit Administration (FTA), as lead federal agency in cooperation with the Federal Railroad Administration (FRA), in preparing this SEIS/EIR. Coordination and consultation with various federal, state, and local government agencies; elected officials; community leaders; organizations; and other individuals from the neighborhoods and communities in the vicinity of the study area was achieved through several means, including a public scoping process.

7.2 OVERVIEW TO THE OUTREACH, COORDINATION, AND CONSULTATION PROGRAM

The agency coordination and community outreach program for the proposed project included the following elements:

- Adhering to the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) notification procedures, including publishing and distributing a Notice of Preparation (NOP) to relevant federal, state, and local agencies; interested parties; and property owners in the project vicinity;
- Distributing the NOP through email announcements, newspaper/media releases, and mailings, including a list of approximately 4,500 individuals and community organizations;
- Conducting a public scoping meeting on May 14, 2013;
- Hosting meetings to brief the San Francisco City Planning Department, transportation-related organizations, and interested parties;
- Providing regular project updates to the TJPA Board of Directors, which are open to the public;
- Updating the project website at http://transbaycenter.org and http://transbaycenter.org/tjpa/documents.
- Distributing a Coordination Plan for Agency & Public Involvement to cooperating and participating agencies.

7.3 KEY ELEMENTS

The key public involvement elements to obtain input into the environmental review process are described below.

7.3.1 Presentations, Briefings, and Meetings

To ensure ongoing coordination and awareness of the Draft SEIS/EIR, presentations and meetings with key agencies, elected officials, and community groups have been organized by the TJPA. Groups that have been briefed or with whom information has been exchanged include the TJPA Board of Directors, San Francisco County Board of Supervisors, San Francisco Planning Commission, the TJPA Citizens Advisory Committee, San Francisco Bay Area Rapid Transit District, Caltrain, California High-Speed Rail Authority, San Francisco City Planning, San Francisco County Transportation Authority, and San Francisco Municipal Transportation Authority.

7.3.2 Project Website and Social Media

As identified above, to keep the public informed, TJPA posts relevant environmental review documents for the SEIS/EIR to the project website at http://transbaycenter.org/tjpa/documents/environmental-documents. The project website (http://transbaycenter.org) provides background information about the entire project, along with an electronic archive of key project documents, including those related to the SEIS/EIR such as the 2004 FEIS/EIR, subsequent addenda, and the 2010 FRA Reevaluation of the FEIS/EIR.

In addition to the project website, TJPA uses social media to provide updates regarding both Phase 1 construction and progress of Phase 2. Facebook, Twitter, and Instagram are all used to notify interested parties of activities and information. Interested parties may also sign up for the mailing list (see below) to receive updates on project developments on a regular basis.

7.3.3 Project Mailings and Email Notifications

A robust distribution list has been developed and maintained to share project information and solicit input on the SEIS/EIR. Currently, the project mailing list includes contact information for more than 4,500 individuals and community organizations. This list consists of the full range of stakeholders such as property owners, project area residents, community groups, civic organizations, neighborhood associations, business and planning professionals, transit agencies, transportation advocacy and environmental groups, local elected officials, state and federal agencies, and other interested parties. The database is maintained and updated on a regular basis.

An email distribution list is also maintained by the TJPA for a wide range of interested parties, including those individuals and groups that have been involved since the start of Phase 1 of the approved Transbay Program. The TJPA keeps the public informed about current activities of the Phase 1 implementation progress through its website, which provides a 10-day look-ahead of Transbay construction activities at http://transbaycenter.org/construction-updates/updates-notices/current-activity.

7.4 PUBLIC SCOPING PROCESS

7.4.1 Purpose and Process of Scoping

NEPA and CEQA specifically require the lead agency to consult with federal, state, and local agencies that have jurisdiction over the proposed project by law or special expertise. The lead agency must also solicit appropriate information from the public during preparation of the environmental compliance documents. Scoping is the process by which the lead agency conducts these activities. This process is intended to help determine the scope of the SEIS/EIR, including the extent of the action, the range of the alternatives, and the types of significant adverse effects to be evaluated. Because this is a supplemental EIS, no new scoping is required pursuant to 40 CFR 1502.9. Therefore, a Notice of Intent was not

prepared for the proposed project under NEPA. The scoping process under CEQA included an early scoping meeting so that input could be considered and incorporated into the SEIS/EIR analysis. A copy of the Scoping Report that describes this process and the comments received in response to the Scoping Meeting and the Notice of Preparation is contained in Appendix A of this SEIS/EIR.

7.4.2 Notice of Preparation

In compliance with the requirements set forth in CEQA, the TJPA, as the lead local agency, prepared an NOP, the purpose of which was to announce the TJPA's intent to prepare an EIR and to initiate the environmental review process. The NOP described the proposed project refinements and improvements, the purpose and need for these refinements and improvements, the alternatives under consideration, and the location and timing of the Scoping Meeting. The NOP was filed with the State Clearinghouse in Sacramento, California, on April 29, 2013.

The NOP solicited participation in determining the scope of the SEIS/EIR by requesting the public to provide their comments to the TJPA and/or attend the Scoping Meeting on May 14, 2013. On April 30, 2013, the NOP was sent to 41 interested parties, including Responsible and Trustee Agencies, and parties previously requesting notice in writing. A 45-day comment period began on April 30, 2013, and closed on June 14, 2013.

7.4.3 Mailings

The TJPA mailed approximately 4,500 postcards on May 2, 2013, publicizing the scoping period and the Scoping Meeting. Postcards were distributed to property owners within 300 feet of each proposed project component.

7.4.4 Website

The TJPA posted information on its website (transbaycenter.org) in advance of the meeting to publicize the NOP, the comment period, and the Scoping Meeting. After the Scoping Meeting, materials presented during the meeting were posted to the website to serve as public record. Copies of all materials provided at the public meeting may be found on the TJPA's website, http://transbaycenter.org/tjpa/documents/environmental-documents, or obtained from the TJPA at 201 Mission Street, Suite 2100, San Francisco, California.

7.4.5 Legal Notices

Legal notices introducing the TJPA and FTA as the lead CEQA/NEPA agencies and providing a summary of the proposed project and the date and time of the Scoping Meeting were published in the *San Francisco Chronicle* on May 6, 2013. This news source was chosen because of its high readership within the project study area and coverage of local events specific to the area.

7.4.6 Email Notices

As stated above, the TJPA is currently constructing Phase 1 of the approved Transbay Program and has assembled an extensive database of interested parties. On April 30, 2013, the TJPA emailed a neighborhood notice to those registered to receive TJPA email notices. The "email blast" announced the Scoping Meeting and invited recipients to attend the meeting and to participate in SEIS/EIR process.

7.4.7 Public Scoping Meeting

The public Scoping Meeting was held to inform the public and interested agencies of the proposed project; identify the resources to be analyzed in the SEIS/EIR; and provide an opportunity for input on the range of proposed alternatives, environmental effects, and any issues of concern. The meeting was held on Tuesday, May 14, 2013, at the TJPA office on 201 Mission Street, Suite 2100, in San Francisco, from 5:00 p.m. to 7:30 p.m. The space was chosen based on its centrality to the impacted communities, convenient access to public transit, and space availability to comfortably accommodate meeting attendees.

The meeting was conducted as an informal open house. Self-guided exhibits were displayed to describe the project study area, the proposed project, and an overview of the environmental process. Attendees were invited to view the information about the proposed project and interact with, and ask questions of, the TJPA staff and environmental consultants (AECOM).

A 30-minute PowerPoint slideshow was presented at approximately 5:30 p.m. to introduce the proposed project and its purpose, issues triggering the need for the proposed project, the schedule for preparing the environmental document, the potential alternatives, and the steps to environmental compliance. A facilitated comment session allowed members of the public to ask questions and provide verbal input.

Comment cards were offered so that meeting attendees could provide feedback on the proposed project. These cards could be completed during the meeting and given to a project team member or filled out after the meeting and sent to the TJPA by Thursday, June 13, 2013.

Approximately 20 people attended the meeting and five provided verbal comments. Five written comments were also received during the public comment period. Below is a summary of recurring topics expressed in the verbal and written comments:

- Environmental impacts should be studied in great detail
- Additional alternatives should be considered
- Seismic stability during construction and after should be evaluated
- Noise, vibration, and traffic circulation during construction should be considered
- Safety concerns during an emergency (e.g., fire, earthquake) should be considered
- Construction methods to avoid disrupting utilities and business access and to reduce traffic congestion should be considered

A scoping report summarizing all comments received during the scoping period was prepared and is available at the TJPA office at 201 Mission Street, Suite 2100, in San Francisco, California. A copy is also included as Appendix A of this SEIS/EIR.

7.5 SUMMARY OF PUBLIC AGENCY COORDINATION

As the NEPA and CEQA lead agencies, the FTA and TJPA identified federal agencies with special expertise or jurisdiction by law over elements or issues related to the project or alternatives to be cooperating agencies in the preparation of the SEIS/EIR. The TJPA and FTA asked the FRA to be a cooperating agency, and the FRA accepted the invitation.

In addition, FTA and TJPA sent letters to state, regional, and local public agencies with interest in the proposed project, inviting them to become participating agencies in the SEIS/EIR. The participating

agency invitation letters presented the information from the NOP, including the project description, draft purpose and need statement, and alternatives, requesting agency comments on the approach and the assessment in the SEIS/SEIR document. Table 7-1 identifies the public agencies contacted and those who agreed to be participating agencies. Table 7-2 summarizes the input received from participating agencies.

Table 7-1
Transbay Program SEIS/EIR Responses from Agencies Invited to Participate

Agency Name by Category	Yes/No/No Response	Responsibilities
Federal		
1. Advisory Council on Historic Preservation	No	Requested Section 106 documentation per 36 CFR Part 800
2. Federal Emergency Management Agency	No Response	
3. Surface Transportation Board	No Response	
4. United States Department of Energy	No	
5. United States Department of Interior, Office of Environmental Policy and Compliance	Yes	Participating agency
6. United States Environmental Protection Agency (EPA) (Region 9)	Yes	Participating agency
7. United States Fish and Wildlife Service	No Response	
State		
8. California Air Resources Board	No	Requested to be a reviewing agency
9. California Department of Fish and Wildlife	No Response	
10. California Department of Housing and Community Development	No Response	
11. California Department of Toxic Substances Control	No Response	
12. California Department of Transportation – District 4	Yes	Participating agency
13. California Native American Heritage Commission	No Response	
14. California Natural Resources Agency	No Response	
15. California Public Utilities Commission	No Response	
16. California State Historic Preservation Office, Department of Parks & Recreation	No Response	
17. California Transportation Commission	No	
18. Governor's Office of Planning & Research	No Response	
Regional		
19. Association of Bay Area Governments (ABAG)	No Response	
20. Bay Area Air Quality Management District (BAAQMD)	No Response	
21. Metropolitan Transportation Commission	No Response	
22. San Francisco Bay Regional Water Quality Control Board	No Response	
23. San Mateo County Transit District/SamTrans	Yes	Participating agency, through involvement by Caltrain/Peninsula Corridor Joint Powers Board
24. Santa Clara Valley Transportation Authority	No	
Transit		
25. Alameda-Contra Costa Transit District (AC Transit)	Yes	Participating agency
26. San Francisco Bay Area Rapid Transit District	No Response	
27. California High-Speed Rail Authority	Yes	Participating agency

Table 7-1
Transbay Program SEIS/EIR Responses from Agencies Invited to Participate

Agency Name by Category	Yes/No/No Response	Responsibilities
28. Caltrain/Peninsula Corridor Joint Powers Board	Yes	Participating agency
29. Golden Gate Bridge, Highway and Transportation District (Golden Gate Transit)	Yes	Participating agency
30. San Francisco Municipal Transportation Agency	No Response	
31. Western Contra Costa Transit Authority	No Response	
Local		
32. San Francisco County Transportation Authority	No Response	
33. San Francisco Planning Department	No Response	
34. San Francisco Office of Community Investment and Infrastructure (OCII) – Successor Agency to the Redevelopment Agency	Yes	Participating agency
Totals	**12 Yes, 5 No, 20 No Response**	

Table 7-2
Summary of Input from Participating Agencies on the Environmental Analysis

Agency	Representatives	Comment Summary
Federal		
FRA	• Stephanie Perez • Melissa Dumond • David Valenstein • Marian Rule (TranSystems)	• Identified concern regarding flood risks and system vulnerability due to sea-level rise • Recommended clarification on the high-speed rail ridership projections • Recommended clarification on the description proposed taxi staging area
EPA (Region 9)	• Zac Appleton • Carter Jessop	• Provided general comments on greenhouse gas and sea level rise and potential effects on projects
Transit		
California High-Speed Rail Authority	• Ben Tripousis • Lillian Hames • Will Gimpel • David Shpak • James Tung	• Recommended clarification on how proposed project components are compatible with California High-Speed Rail Authority standards and what components of the Transbay Program occur during Phase 1 versus Phase 2 • Recommended incorporating ridership forecasts from more current Business Plan • Recommended that it be clarified that the high-speed train service would not be possible under the approved Transbay Program (i.e., the No Action Alternative) • Recommended clarification on high-speed rail contributions to air and greenhouse gas emissions reductions

Table 7-2
Summary of Input from Participating Agencies on the Environmental Analysis

Agency	Representatives	Comment Summary
Caltrain/Peninsula Corridor Joint Powers Board	• Marian Lee • Stacy Cocke	• Provided details on the Caltrain Modernization Program and information on the Peninsula Corridor Electrification Project EIR • Identified Caltrain railyard improvements and helped define the additional trackwork needed for operations south of the Caltrain railyard • Provided input on Caltrain ridership and operations (anticipated number of trains) • Recommended additional project and cumulative analysis of the proposed project's impacts on Caltrain operations and service, especially the now approved Peninsula Corridor Electrification Project
Local		
San Francisco Planning Department	• Elizabeth Purl • Joshua Switzky	• Recommended addition of adjacent land development project component to support area plans • Provided input on overall structure and organization of the SEIS/EIR • Recommended clarification of the proposed project's incremental impacts as well as information about whether the incremental impacts would change the significance conclusions from the 2004 FEIS/EIR and/or require additional mitigation measures • Provided input on the list of cumulative projects • Coordinated efforts to obtain and apply the City's CHAMP traffic model • Requested incorporation of transportation analysis from surrounding area plans such as the Transit Center District Plan and the Central SoMa Plan • Provided information on sea-level rise and identified concern about flood risks • Recommended use of City's measure to avoid potential health risks from toxic air contaminants • Recommended underpinning properties that contribute to historic districts in order to preserve the buildings
OCII – Successor Agency to the Redevelopment Agency	• Courtney Pash	• Provided input on the development program and allowable heights for the adjacent land development

Since initiation of the environmental process, TJPA has coordinated on a regular basis with Caltrain and the California High-Speed Rail Authority (CHSRA) regarding design aspects of the Downtown Rail Extension (DTX) refinements. In addition, input from these participating agencies was specifically sought on the purpose and need, options to the DTX refinements, and impact analyses. Feedback from Caltrain and the CHSRA was incorporated into this draft document.

Similar planning and engagement sessions have been held with San Francisco City Planning, OCII, and the various transit operators to discuss the design of the facilities. The meetings with San Francisco City Planning and OCII have focused on opportunities for land development on sites proposed for partial use by proposed project components and the City's feasibility study for possible development at the Caltrain

railyard, which is underway. Meetings were also held with San Francisco City Planning to discuss the transportation, land use, socioeconomics, visual, and cultural resources analyses of the proposed project components. Coordination with the transit operators, including Golden Gate Transit, AC Transit, Greyhound, and Amtrak, that would use the Transit Center and intercity bus facility, provided input on how the proposed project could affect their operations and schedules.

Each of the participating agencies was provided with early draft copies of the Draft SEIS/EIR to offer comments and suggestions. TJPA contacted each agency to offer a meeting to review the document contents and to assist in identifying where particular topics were addressed in the document. FRA, EPA, San Francisco City Planning, OCII, Caltrain, and CHSRA subsequently provided specific suggestions on environmental topics of interest to them. Those comments, summarized in Table 7-2, were incorporated, as appropriate, and are reflected in this Draft SEIS/EIR. Substantive feedback was received on flood hazards and sea-level rise, protection of historic resources, greenhouse gas emissions, and the intensity and type of adjacent land development.

7.6 CONSULTATIONS PURSUANT TO FEDERAL ACTS AND ENVIRONMENTAL LEGISLATION

The proposed project would not affect sensitive biological species governed by the federal Endangered Species Act or wetland resources protected by the federal Clean Water Act, since these resources are not present within the proposed project study area. As described in Section 3.7, Biological Resources, based on the results of the California Natural Diversity Data Base (CNDDB) query and previous CEQA and NEPA environmental documents, as well as an evaluation of the habitat conditions of the project area, all species present on the CNDDB list were eliminated from further evaluation because the project area does not provide suitable habitat for them. As such, there was no need to consult with the U.S. Fish and Wildlife Service or the U.S. Army Corps of Engineers regarding listed biological species or wetlands, respectively. Preliminary Section 4(f) determinations are presented in Chapter 6 of this Draft SEIS/EIR

Historic resources protected by the National Historic Preservation Act and Section 4(f) properties under the jurisdiction of the federal Department of Transportation are within the proposed project study area and may be affected. Accordingly, the FTA has consulted and is still consulting with the State Office of Historic Preservation and the State Historic Preservation Officer (SHPO). A letter requesting SHPO concurrence with the archaeological and architectural Areas of Potential Effect and the identification of historic resources was submitted on September 11, 2015 (see Appendix G.1). SHPO concurrence on the Areas of Potential Effect and inventory of historic resources was received on December 8, 2015 (see Appendix G.1). Preliminary conclusions regarding effects to these resources are presented in Appendix G.2 and summarized in Section 3.6, Historic and Cultural Resources, of this document.

In addition to the Notice of Preparation, the SHPO was contacted specifically to discuss options for preparing the Section 106 documentation for effects to historic properties. Section 106 of the National Historic Preservation Act provides guidelines and directions for inventorying and evaluating effects to historic properties. In a December 2013 meeting, SHPO was requested to comment on the option of using the standard Section 106 documentation or using the SEIS/EIR NEPA review to comply with Section 106. This latter approach is consistent with the provisions of 36 CFR 800.8(c) regarding "substitution" as well as the 2013 guidance published by the Advisory Council on Historic Preservation (ACHP) and the Council on Environmental Quality (CEQ) called *NEPA and NHPA: A Handbook for Integrating NEPA and Section 106*. The SHPO, following consultation with the Advisory Council on Historic Preservation, recommended in February 2014 that the FTA and the TJPA follow the standard Section 106 process.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and FTA's 2012 Circular and U.S. Department of Transportation Order

5610.2(a) on complying with this executive order, requires outreach to these targeted populations. The multiple outreach efforts, starting with the 2004 FEIS/EIR and continuing with the scoping/noticing activities undertaken by the TJPA, have served to inform and educate the general public and particularly those in the project corridor about the original Transbay Program and its ongoing refinements. Following review of a neighborhood socioeconomic profile completed by the City and County of San Francisco, the most recent Census data, and the current American Community Survey estimates, the TJPA identified community organizations in the portion of the City serving minority and low-income groups and potentially affected by the proposed project. Invitations were extended to these organizations to better understand the populations served by them, to determine if other organizations should be consulted, and to present the potential effects and mitigation measures. On January 20, 2015, the TJPA met with representatives of the following organizations to review the project and its effects and to solicit further consideration of potential environmental justice concern:

- South of Market Community Action Network - a multi-racial, community organization that educates, organizes and mobilizes the immigrant and low-income South of Market (SoMa) residents to achieve social and economic justice and equity. The group was established in 2000 by community leaders from the youth, senior, veteran, Filipino and housing organizations. The organization primarily serves economically disadvantaged residents of SoMa.

- Asian Neighborhood Design - a non-profit architecture, community planning, employment training and support services organization dedicated to reduce poverty and revitalize neighborhoods in the Bay Area by building healthy communities and providing opportunities for low-income residents. This group is located in SoMa and works with economic disadvantaged communities throughout San Francisco.

- Filipino American Development Foundation - a non-profit organization founded in 1997 to strengthen the social and economic well being of the Filipino American community in the SoMa neighborhood in San Francisco with special attention to the underserved segments of the community.

These groups, as well as other identified organizations, have been included in the TJPA's list for public notices and communications, and will be advised of ongoing TJPA activities as highlighted in the section below.

7.7 SUMMARY OF PUBLIC INVOLVEMENT AND NEXT STEPS

7.7.1 Public Scoping Meeting

The TJPA and FTA conducted a public information and outreach program for the Transbay Program scoping process. The public outreach components centered on the Scoping Meeting.

A scoping summary report was prepared describing the various components of the scoping process, including an overview of the public involvement and comments received, public meeting conducted, and a summary of community outreach activities. Supporting documentation included copies of the agency mailing list, legal notice, scoping meeting agenda, a blank comment card, meeting sign-in sheets, transcript of proceedings, direct mail notice, exhibits, and copies of letters received during the scoping period.

7.7.2 Public Review and Comment on SEIS/EIR

The Draft SEIS/EIR was distributed on December 28, 2015. Copies of the Draft SEIS/EIR were provided to local, state, and federal agencies, and interested community groups and individuals (see Chapter 10,

Distribution List). A copy of the Draft SEIS/EIR was also posted on the TJPA website. An approximately 60-day public review period will be held to receive comments on the Draft SEIS/EIR, which will extend from December 28, 2015 to February 29, 2016. The TJPA will hold a public meeting to receive public comments on the Draft SEIS/EIR on February 10, 2016 at 5 pm at the TJPA office (201 Mission Street, Suite 2100, San Francisco, CA). The invitation to the public hearing will be made using methods similar to those used for the Scoping Meeting. In addition to comments received at the public hearing, TJPA will accept written comments on the Draft SEIS/EIR and email comments sent to the following addresses:

Brenda Perez
Federal Transit Administration
Region 9 Office
90 7th St., Suite 15-300
San Francisco, CA 94103-6701
Email address: brenda.perez@dot.gov

Scott Boule
Legislative Affairs & Community Outreach Manager
Transbay Joint Powers Authority
201 Mission Street, Suite 2100
San Francisco, CA 94105
Email address: SEIS.EIR@transbaycenter.org

Following the close of the public comment period, the TJPA and FTA will consider all comments and prepare responses to substantive written and oral comments on the Draft SEIS/EIR and prepare a Final SEIS/EIR that includes the responses and any revisions to the Draft SEIS/EIR.

Upon completion of the Final SEIS/EIR, the FTA and TJPA will publish a notice of its availability. The Final SEIS/EIR will be available for public review at the same locations where the Draft SEIS/EIR was made available, and copies will be distributed to people who commented on the Draft SEIS/EIR, interested parties, and agencies that have authority over aspects of the project.

7.7.3 Project Approval

The environmental document must be certified or approved before the proposed project can be approved.

Pursuant to the requirements of CEQA, the TJPA Board must certify that the Final SEIR has been completed in compliance with CEQA and reflects the independent judgment of the TJPA. In addition to certifying the SEIR, the Board must make "findings" for each significant environmental impact identified in the Final SEIR, and adopt and incorporate into the Project all feasible mitigation measures. These actions must be completed before the TJPA can take action to approve the project. Following approval of the project, the TJPA must file a *Notice of Determination* to report its approval of the proposed project.

Similarly, for NEPA, the FTA must review the Final SEIS and approve it for public release through a Notice of Availability in the Federal Register. FTA will consider any comments in rendering its decision on the proposed project and then issue a public *Record of Decision* (ROD) describing the findings of the SEIS and the rationale for its decision. FTA may issue a single Final SEIS and ROD document pursuant to Public Law 112-141, 126 Stat. 405, Section 1319, unless FTA determines that statutory criteria or practicability considerations preclude issuance of the combined document pursuant to Section 1319. If the FTA cannot issue a joint Final SEIS/ROD document, then the FTA may amend its previous ROD instead of issuing a new ROD.

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CHAPTER 9 LIST OF PREPARERS

9.1 LEAD AGENCIES

Federal Transit Administration, Federal NEPA Lead

Ray Sukys
Eric Eidlin
Brenda Perez
Mary Nguyen
Dan Koenig

Federal Railroad Administration, Cooperating Agency

David Valenstein
Stephanie Perez

TJPA, Local CEQA Lead

Maria Ayerdi-Kaplan	Executive Director
Brian Dykes, P.E.	Project Manager/Principal Engineer
Meghan Murphy, P.E.	Project Engineer
Joyce Oishi	Program Coordinator
Maria Wada	Program Coordinator

9.2 CONSULTANT TEAM

AECOM

Rodney Jeung	Project Director
David Reel	Project Manager
Anne Ferguson	Project Coordinator
Jeffrey Chan	Transportation Lead
Susan Yogi	Visual/Aesthetics Lead, Technical Reviewer
Elliott Schwimmer	Project Coordinator, Environmental Justice, Graphics, and GIS Support
George Lu	Air Quality/Greenhouse Gases Lead
Mark Bowen	Cultural Resources – Built Environment
Patricia Ambacher	Cultural Resources – Built Environment
Kerry Boutte	Paleontology
Whitney Broeking	Utilities, Safety and Security, Electromagnetic Fields
Michael Kay	Section 4(f)
Juliana Lehnen	Public Services, Community Services, and Recreational Facilities, and Section 4(f)
Kara Baker	Flood Hazards, Sea-Level Rise, Technical Reviewer
Anne McDonnell	Editor
Beth Duffey	Editor
Charisse Case	Document Specialist
Kristine Olsen	Document Specialist

AETYPIC, Inc.

Bahram Khamenehpour	Geology, Hazardous Materials
Sami Malaeb	Hazardous Materials
Kamran Ghiassi	Geology, Geotechnical Hazards

BioMaAs

Dennis Kearney	Biological Resources
Bill Stagnaro	Biological Resources

Daniller Consulting

Gia Daniller	Public Outreach
Karen Molinari	Public Outreach
Aimee Ellis	Public Outreach

Seifel Consulting

Elizabeth Seifel	Land Use, Socioeconomics
Stephanie Hill	Land Use, Socioeconomics
Kohki Shiga	Land Use, Socioeconomics
Shay Fitzpatrick	Land Use
Marie Munson	Land Use

Square One Productions

Angela Lin	Visual Simulations
Monica L. Scott	Visual Simulations

Terry A. Hayes Associates

Sam Silverman	Air Quality, Greenhouse Gas, and Noise
Ehsan Hosseini, Ph.D.	Air Quality and Greenhouse Gas
Michael Sullivan	Noise

Transportation Analytics

Diana Dorinson	Financial Considerations

William Self Associates

Jim Allan	Archaeology
Heather Price	Archaeology
Nazih Fino	GIS Specialist

WRECO

Analette Ochoa	Hydrology and Water Quality
Diane Wang	Hydrology and Water Quality
Wana Chiu	Hydrology and Water Quality

CHAPTER 10 DISTRIBUTION LIST

10.1 PUBLIC AGENCIES

Federal Agencies

Advisory Council on Historic Preservation
Department of Homeland Security
Federal Emergency Management Agency
Surface Transportation Board
U.S. Department of Energy
U.S. Department of Interior, Office of Environmental Policy & Compliance
U.S. Environmental Protection Agency, Region 9
U.S. Fish and Wildlife Service

State Agencies

Business, Transportation & Housing Agency
California Air Resources Board
California Department of Fish & Wildlife
California Department of Housing & Community Development
California Department of Parks & Recreation, Office of Historic Preservation
California Department of Toxic Substances Control
California Department of Transportation (Caltrans) District 4
California High-Speed Rail Authority
California Integrated Waste Management Board
California Native American Heritage Commission
California Natural Resources Agency
California Public Utilities Commission
CalRecycle
California Transportation Commission
Governor's Office of Research and Planning, State Clearinghouse
Northwestern Information Center

Regional Agencies

Association of Bay Area Governments (ABAG)
Bay Area Air Quality Management District
Metropolitan Transportation CommissionRegional Water Quality Control Board, San Francisco Bay Region
San Francisco Bay Conservation and Development Commission

County Agencies

City/County Association of Governments – San Mateo County

City and County of San Francisco Agencies

San Francisco County Transportation Authority
San Francisco Municipal Transportation Agency
San Francisco Office of Community Investment and Infrastructure
San Francisco Planning Commission
San Francisco Planning Department
San Francisco Public Utilities Commission

10.2 ELECTED OFFICIALS

San Francisco Board of Supervisors
San Francisco Mayor Ed Lee
San Francisco State Assembly Members Phil Ting and David Chiu
San Francisco State Senator Mark Leno
U.S. Representative Nancy Pelosi
U.S. Senator Barbara Boxer
U.S. Senator Dianne Feinstein

10.3 PUBLIC LIBRARIES

MTC/ABAG Library
San Francisco Central Library

10.4 PUBLIC TRANSIT OPERATORS

AC Transit
Bay Area Rapid Transit District
Golden Gate Bridge, Highway, and Transportation District
Peninsula Corridor Joint Powers Board
San Mateo County Transit District
Santa Clara Valley Transportation Authority
Western Contra Costa Transit Authority

10.5 MEDIA

San Francisco Business Times
San Francisco Chronicle
San Francisco Examiner

10.6 COMMUNITY GROUPS AND ORGANIZATIONS

Alliance for a Better District 6
Asian Neighborhood Design
BayRail Alliance
Filipino American Development Foundation
League of Women Voters of San Francisco
League of Women Voters of the Bay Area
Livable City
Regional Alliance for Transit
Rescue Muni
Rincon Hill/South Beach/Mission Bay Neighborhood Association
San Franciscans for Reasonable Growth
San Francisco Architectural Heritage
San Francisco Bicycle Coalition
San Francisco Planning and Urban Research (SPUR)
San Francisco Tomorrow
SOMCAN – South of Market Action Network
South of Market Business Association (SOMBA)
Train Rider's Association of California
Transbay Alliance
TransForm
Transportation Solutions Defense & Education Fund (TRANSDEF)
Walk San Francisco

10.7 POTENTIALLY AFFECTED PROPERTY OWNERS

120 Second Street Corp., c/o Jay Walsh
Terri L. Brown
Thomas Bryne, c/o trustee of the Peter F. Byrne Revocable Trust
Virgil Chen, InvesMaster Corporation
Christopher John Decenzo
Claude & Nina Gruen, c/o 564 Howard Street, LLC
Nader Heydayian, c/o 2005 Heydayian/Nouri Family Trust
Howard Historic Properties, c/o Patrick McNerney
Lawrence Marcus
Martin Properties LLC, c/o Patrick McNerney
Patrick McNerney
Sean Noonan
Fereshteh Nouri, c/o 2005 Heydayian/Nouri Family Trust
Hamideh Nouri, c/o 2005 Heydayian/Nouri Family Trust
Lynn Marie Pelichoff
Scott Eric Pelichoff
Abbas A. Razaghi
Wendy Roess-Decenzo
Tony and Vivian Shelley
Alyce M. Stanwood
Steel Arc Properties LLC, c/o Patrick McNerney
Andrew S. Teufel

10.8 INDIVIDUALS

Gerald Adams
Bruce Agid
Michael Alfaro
Bruce W. Barnes
Collin Barreno
Luis Belmonte
Reed H. Bement
William Blackwell
Eugene Bradley
Roger Brandon
Adrian Brandt
Lynn Bunim
J. R. Capron
Steve Caramia
Elizabeth Carney
Jeff Carter
Bernie Choden
Myron Chadowitz
James Whittmann Dear
Martin DeNero
Tom Dillon
Pamela Duffy
Mark Duncan
John Gasser
Edward A. Green
Ted Groger
James W. Haas
Sue Hestor
Oliver L. Holmes
Seymour Jaron
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Michael Kiesling
Roland Lebrun
William Lee
Andrew Littlefield
David Lonergan
Yevgeniy Lysyy
Francis Mathews
Mary McDonald
Arthur L. Meader III
Mary Anne Miller
Susan Miller
Patrick Moore
Matthew Morrison
Patrick Moyroud
James M. Patrick
Greg Patterson
Mrs. G. Bland Platt
Ted Pollak
James Reuben
Norman Rolfe
Michael Rothenberg
John Sanger, Esq.
Pascal Savoy
Peter Sheerin
Andrew Sullivan
Steven Vettel
Tay C. Via
Art Wagner
Frances Wong
George Yamas

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