Transbay Transit Center Program

Final Supplemental Environmental Impact Statement/ Environmental Impact Report

Volume 1: Final SEIS/EIR

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TJPA
TRANSBAY JOINT POWERS AUTHORITY

U.S. Department of Transportation
Federal Transit Administration

U.S. Department of Transportation
Federal Railroad Administration

Final 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 Law (49 USC 53), Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303), 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. 114-94 Section 1304 unless FTA determines statutory criteria or practicability considerations preclude issuance of the combined document pursuant to Section 1304.

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NOV 20 2018
Date

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NOV 20 2018
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Appendices

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
ADA	Americans with Disabilities Act
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
FAST Act	Fixing America's Surface Transportation Act
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
gsf	gross square feet
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
LRDP	Long Range Development Plan
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
NBA	National Basketball Association
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
RAB	Railyard Alternatives and I-280 Boulevard Feasibility (now referred to as the Rail Alignment and Benefits Study)
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	Special Use District
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCDP	Transit Center District Plan
TEP	Transit Effectiveness Project
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
UCSF	University of California San Francisco
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

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 that opened in August 2018, 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).

A Draft 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, other transportation improvements, and development opportunities associated with the Transbay Program. The changes are collectively referred to as the "proposed project." The Draft SEIS/EIR was issued in December 2015 for public review and comment. This Final SEIS/EIR incorporates the Draft SEIS/EIR, responds to comments on the Draft SEIS/EIR, and updates sections of the Draft SEIS/EIR based on responses to comments and input from the public, TJPA, the City and County of San Francisco (City), Caltrain, and the FTA.

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 that would result in significant environmental impacts not previously evaluated.

S2 WHAT IS THE TRANSBAY PROGRAM?

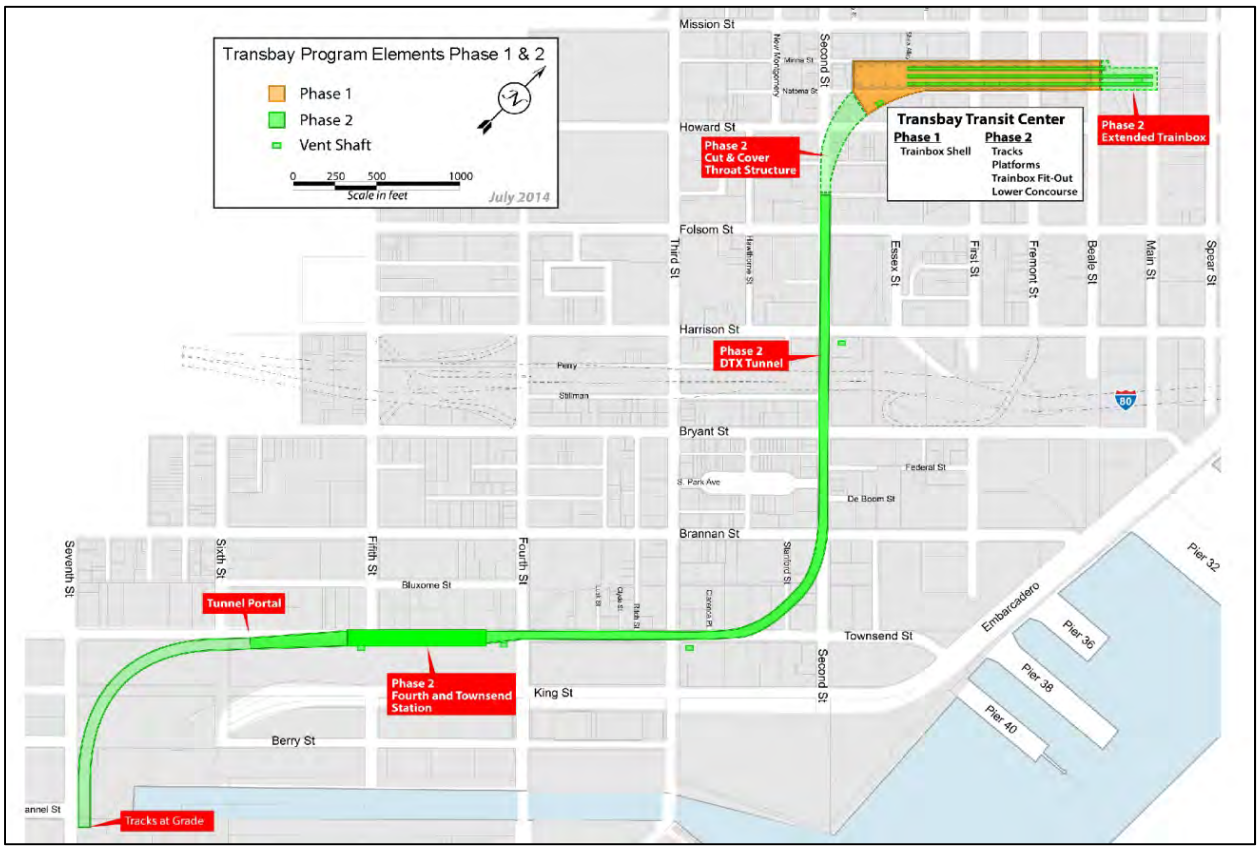
The Transbay Program is a visionary and transformative plan to reshape an area of the city of San Francisco near the downtown and financial core. The program was developed to:

- 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; 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). Phase 1, now complete, created a "Grand Central Station of the West" in the heart of a new transit-friendly neighborhood. The station serves eight Bay Area counties through multiple bus transit systems: AC Transit, Golden Gate Transit, Greyhound, San Francisco Municipal Railway (Muni), SamTrans, WestCAT Lynx, Amtrak, and Paratransit. Phase 1 commenced in 2008 with construction of the Temporary Terminal. Phase 1 was completed and the new Transit Center was opened in August 2018; however, the Transit Center is temporarily closed for repairs. Phase 2 primarily will include completion of the Transit Center below-grade levels, the DTX for Caltrain and HSR, and connections to the Bay Area Rapid Transit, all of which will enhance transit connections throughout the region and the rest of the state.

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 these areas and other transportation services available at the Transit Center.



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

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

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 rail extension and 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 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, improve methods for constructing the mined tunnel segment, and provide trackwork to enable efficient and reliable operations between the Caltrain railyard and the Transit Center.

- 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 Final SEIS/EIR.[1]

The 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.

[1] Table S-1 showing revisions to the version in the Draft SEIS/EIR (in underline and strikethrough) based on comments from the public, the City, and others is included in Section 2.2 of this Final SEIS/EIR.

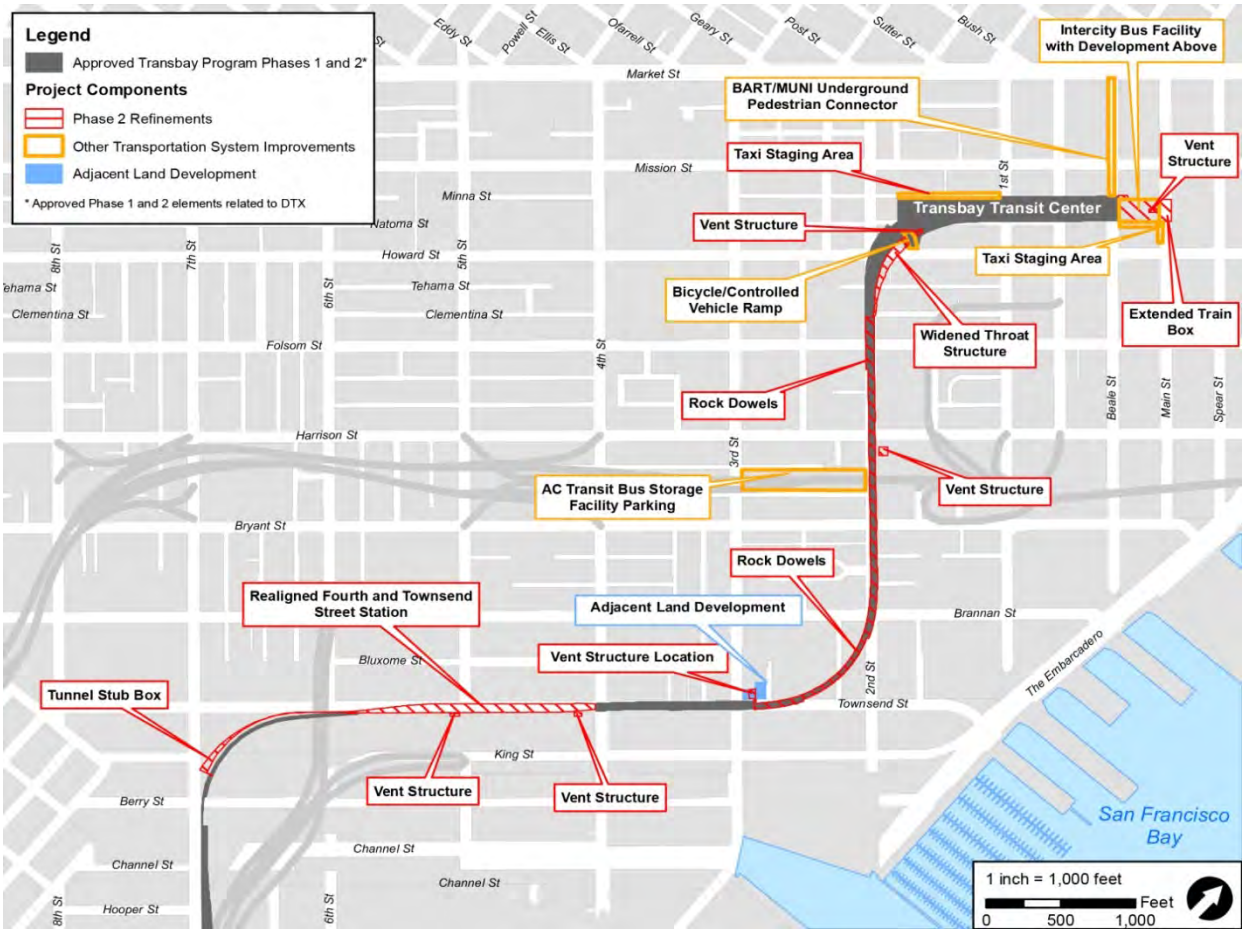
Table S-1
Proposed Project

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 occur below grade and within the Townsend Street right-of-way.	▪ 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 - 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 Third and Townsend Streets** – The proposed project would allow 72,000 square feet of office or other commercial space at the northeast corner site.	▪ *New component.* The approved Transbay Program did not include any new development at Third and Townsend Streets.

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

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. Most notable is the 2012 adoption by the City of a land use plan for the vicinity of the Transit Center. 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.

The City's Central South of Market Plan (Central SoMa Plan) is pending final approval and will promote mixed-use development, museums, and entertainment venues along the Central Subway project currently under construction that is planned to open in 2019. The plan covers a 230-acre area between Second and Sixth Streets and between Market and Townsend Streets, and borders the DTX, including the Fourth and Townsend Street Station. 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. An additional 33,000 jobs and over 8,000 new housing units, of which at least 33 percent would be permanently affordable are projected, a substantial increase over the 10,000 jobs and 2,500 housing units under existing City regulations.

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 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.

Related Studies

In the period between the issuance of the Draft SEIS/EIR in December 2015 and this Final SEIS/EIR, the following studies and reports relevant to the DTX have been prepared.

Tunnel Options Study for the Downtown Rail Extension Project (Tunnel Options Study) – In response to Draft SEIS/EIR comments regarding the proposed project's construction impacts to adjacent properties and businesses, the TJPA initiated a Tunnel Options Study to explore the possibility of reducing segments planned for cut-and-cover construction and constructing those segments instead by different mining methods. The resulting Tunnel Options Study Report was issued on November 7, 2017, and subsequent addenda were completed by March 2018. Viable construction methods from the Tunnel Options Study that could reduce the adverse effects associated with the cut-and-cover construction technique have been described and evaluated in this Final SEIS/EIR.

Rail Alignment and Benefits Study (RAB Study, previously known as the Railyard Alternatives and I-280 Boulevard Study) – In 2014, the City launched a feasibility study to consider the consolidation or relocation and redevelopment of the Caltrain Railyard, alternative routes to bring Caltrain and future HSR service to the Transit Center, and removal of the elevated I-280 freeway and its replacement with a grand boulevard. At the time of the Draft SEIS/EIR's publication, the City had completed a Phase I feasibility assessment of options, and Phase II development of alternatives was underway. In May 2018, the City recommended the DTX alignment to the Transit Center that was previously approved in 2004, but also included an underground extension of DTX along Pennsylvania Avenue south to the existing Caltrain Station at 22nd Street. The recommendations from the RAB study would not affect the construction schedules of the underground rail station at the Transit Center or the DTX, and have reaffirmed the DTX alignment previously approved and modified as part of the proposed project.

Peer Review Panel Report on Findings, Review of Three Operations Studies for the Design of the Caltrain Downtown Extension (2-3 Track Study) – A Peer Review panel was assembled by the San Francisco County Transportation Authority (SFCTA) in fall 2017 to review three operational studies related to the extension of Caltrain and the California High Speed Rail Authority (CHSRA) HSR service to the Transit Center, primarily focused on whether two tracks instead of the planned three tracks for DTX would be feasible. The peer review produced a final report in April 2018, concluding that three tracks would be necessary to provide reliable and dependable service into the Transit Center. Without three tracks, a delay or track blockage in the tracks leading to the terminal or a delay at the platforms would upset train schedules and result in longer recovery times from operational delays. The third track provides the capacity to simultaneously handle inbound and outbound trains when one of the three tracks is blocked due to a disabled train, maintenance outage, or other delays in arrivals or departures from the train platforms.

Regulatory Changes

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

- New or expanded historic districts;
- More stringent water quality standards governing stormwater runoff;
- Updated noise and vibration assessment guidelines from FTA;
- 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"), which in turn was updated in 2015 by the Fixing America's Surface Transportation Act ("FAST Act"), 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.

Effect of Changed Circumstances on 2004 EIS/EIR Conclusions

The chart on the following page summarizes and explains the relationship of new information and circumstances pertinent to the Transbay Program to the analysis in the SEIS/EIR and does not lead to changes to the significance conclusions in the 2004 FEIS/EIR. Similarly, this summary chart indicates that there is no new information resulting in significant impacts not described in the 2004 FEIS/EIR or assessed in this Final SEIS/EIR.

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.

Transbay Project Components	Status	Effect of Changed Circumstances on 2004 EIS/EIR conclusions
Transit Center		
▪ Transbay Terminal: demolition and new temporary terminal	Completed	Not applicable
▪ Phase 1: Transit Center	Opened in August 2018	Not applicable
▪ Phase 2: Below grade improvements	Pending funding	Improvements are underground and are not affected by nor affect conditions above ground. The impacts due to Caltrain and high-speed rail service were updated in the 2010 Federal Railroad Administration Reevaluation of the 2004 FEIS/EIR and specifically updated the 2004 FEIS/EIR traffic analysis and considered greenhouse gas emissions. In addition, impacts of the Caltrain extension are included in the TCDP EIR that was certified in 2012. The results of these environmental documents are reported in the Draft SEIS/EIR (see particularly pages 3.2-15 and 3.2-16 regarding transportation).
DTX		
▪ Alignment and Construction Method	Pending funding	No change to impacts of the proposed underground alignment involving cut-and-cover and mined tunnel construction. Long-term operational impacts would not change due to new circumstances. Temporary construction would continue to result in substantial traffic delays, socioeconomic impacts, dust and noise emissions, and settlement. Other construction methods are discussed in Chapter 2 and in Appendix A (Master Response 4) of this Final SEIS/EIR to reduce construction-related impacts.
▪ Fourth and Townsend Station	Superseded by the proposed project	Impacts of the realigned station are evaluated in this Final SEIS/EIR, which considers new and changed circumstances.
▪ Vent Structures / Emergency Exits	Superseded by the proposed project	Impacts of the vent structures are evaluated in this Final SEIS/EIR, which considers new and changed circumstances.
▪ U-Wall at Caltrain railyard	Pending funding	No change to impacts of the proposed transition structure for trains to move between at-grade and below-ground segments. This component is located entirely within the Caltrain railyard, and TJPA and Caltrain have coordinated on how the entire DTX component could affect Caltrain. These impacts are documented in the Peninsula Corridor Electrification Project EIR, certified in 2015. Long-term operational impacts of this project component would not change due to new circumstances; temporary construction impacts would continue to result in substantial traffic delays on surrounding streets.
▪ Underground Pedestrian Connector	Superseded by the proposed project	Impacts of the connector are evaluated in this Final SEIS/EIR, which considers new and changed circumstances.
Redevelopment Plan		
▪ Land use and circulation changes	Largely superseded by the TCDP	Impacts of the TCDP are examined in an EIR certified by the City in 2012. The land use and circulation changes of this plan are recognized in this Final SEIS/EIR, including in the transportation analysis.

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 mitigation measures 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 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 Table S-2.

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 measures in the Draft SEIS/EIR were 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. Changes to mitigation from the Draft to Final SEIS/EIR are due to City requests for a traffic monitoring measure at the at-grade crossing with the turnback track and a transportation analysis to supplement the assessment in the Draft SEIS/EIR; TJPA staff-initiated changes for clarification; better understanding of what is already required and stipulated in the Memorandum of Agreement with the State Historic Preservation Officer governing protection of historic resources; and clarifications and modifications in response to public comments on the Draft SEIS/EIR. For the specific impacts that would trigger the need to implement mitigation measures and a description of the mitigation measures, see Table S-2.[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

[2] Table S-2 showing revisions to the version in the Draft SEIS/EIR (in underline and strikethrough) based on responses to comments and consultation with the State Historic Preservation Officer is included in Section 2.2 of this Final SEIS/EIR.

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

With implementation of the proposed mitigation measures, two impacts under CEQA would remain significant and unavoidable and would not be substantially reduced by considering an alternative to the proposed project:

- 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 implement flood protection strategies. 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?

Alternatives to Phase 2 were discussed in the 2004 FEIS/EIR and included alternative alignments, station configurations, and construction methods for the DTX. The focus of this SEIS/EIR is not a comprehensive reexamination of the previously approved Transbay Program, but specific, proposed modifications, or refinements, to Phase 2. The proposed project consists of refinements and improvements to Phase 2 of the adopted Transbay Program that seek to further achieve and support the purpose and need for the approved program. The TJPA has considered options or variations to implementing individual proposed project components, including potential tunnel construction methods other than the cut-and-cover construction technique, and these are described in detail in Chapter 2 of this Final SEIS/EIR.

Based on the analysis presented in this Final SEIS/EIR, the proposed project, consisting of the approved Transbay Program and the refinements to the Program by the proposed project, is the environmentally superior alternative under CEQA and the environmentally preferable alternative under NEPA. This determination is made because the proposed project, compared to the No Action Alternative, would enable a portion of the building at 165-173 Second Street (also referred to as 171 Second Street) to be preserved, thereby eliminating a significant and unavoidable adverse effect on an historical resource; because it enhances resiliency and seeks to minimize hazards from flooding and sea-level rise; because it incorporates additional measures to reduce construction air and greenhouse gas emissions; incorporates additional measures to avoid and protect migratory birds and paleontological resources; and enables HSR service to travel to the Transit Center and realize the regional and statewide air quality, greenhouse gas, and energy benefits identified for the HSR program.

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 WHAT AREAS OF CONTROVERSY HAVE BEEN IDENTIFIED DURING THE ENVIRONMENTAL REVIEW PROCESS?

In response to the release of the Notice of Preparation, the scoping meeting, information provided to participating agencies, and the public review period following release of the Draft SEIS/EIR, 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 impacts associated with cut-and-cover construction where proposed along Howard, Second and Townsend Streets and consideration of other construction methods that could reduce potential impacts of cut-and-cover construction;
- Traffic and safety impacts of the 16th Street at-grade crossing;
- Potential settlement, groundwater, and property impacts during construction;
- The implications of updated land use plans and recent development projects adjacent to the proposed project;
- 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 WHEN WAS THE DRAFT SEIS/EIR RELEASED FOR PUBLIC REVIEW AND COMMENTS, AND WHAT COMMENTS WERE RECEIVED?

The Draft SEIS/EIR was made available for public review and comment on December 28, 2015. Copies of the Draft SEIS/EIR were provided to local, state, and federal agencies, organizations and individuals (see Chapter 10, Distribution List of the Draft SEIS/EIR). A copy of the Draft SEIS/EIR was also posted on the TJPA website. A 60-day public review period was held to receive comments on the Draft SEIS/EIR, from December 28, 2015 to February 29, 2016. The TJPA held a public meeting to receive public comments on the Draft SEIS/EIR during the comment period on February 10, 2016 at 5 pm at the TJPA office (201 Mission Street, Suite 2100, San Francisco, CA). In addition to comments received at the public meeting, TJPA accepted written and email comments on the Draft SEIS/EIR.

In total, 22 comment submissions (e.g., comment cards, e-mails, and letters) containing 153 individual comments were received. Responses to these comments were incorporated into the Final SEIS/EIR (Chapter 2 and Appendix A). Three comment letters were received after the close of the public review period; the TJPA and FTA have included and responded to them in this Final SEIS/EIR.

S10 WHAT IS IN THIS FINAL SEIS/EIR?

This document is the Final SEIS/EIR and consists of the Draft SEIS/EIR (December 2015) and this document, which contains revised sections of the Draft SEIS/EIR and responses to comments received during the Draft SEIS/EIR public review period. Draft SEIS/EIR sections not included in this Final SEIS/EIR remain unchanged and have not been republished. Sections that have been updated are included in this document in Chapter 2.

This Final SEIS/EIR includes an introductory chapter (Chapter 1), updated sections from the Draft SEIS/EIR (Chapter 2), responses to comments (Appendix A), National Historic Preservation Act – Section 106 continuing consultation documentation (Appendix B), a transportation analysis supplement (Appendix C), and 2018 Final SEIS/EIR Mitigation Measures and Monitoring Program, including an updated version of the list of Transbay Program mitigation measures (Appendix D.1) and the Mitigation Monitoring and Reporting Program (MMRP) (Appendix D.2) from the 2004 FEIS/EIR based on new and revised mitigation measures from the Final SEIS/EIR.

S11 WITH APPROVAL OF THE ENVIRONMENTAL DOCUMENT, DOES THAT MEAN THAT THE PROJECT WILL MOVE FORWARD?

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

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* providing notice of 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.

For this project, after the consideration of comments received during and after the circulation of the Draft SEIS, FTA determined that practicality considerations preclude the issuance of a combined Final SEIS and Record of Decision (which is the FTA's decision document and describes its rationale for its decision on the project). The FTA has approved this final environmental document, in accordance with 23 CFR 771.125, and issued this Final SEIS for a 30-day public review. Following this review, the FTA will make its findings regarding the project. If approved, the FTA will issue an Amended Record of Decision ("amended" because it revises the 2005 Record of Decision for the original Transbay Program).

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	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, result in localized circulation and access effects, or cause major traffic hazards.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	*New-I-TR-1.1 Traffic Improvement and Adaptive Management Plan.* A traffic improvement plan and adaptive management plan will be developed for the two at-grade intersections along the turn-back track length (7th Street/Mission Bay Drive and 16th Street/Mississippi Street/7th Street) which will outline all aspects of avoiding, minimizing, and compensating for all temporary and permanent impacts associated with the project. The traffic improvement plan will be reviewed and approved by the City and County of San Francisco prior to implementation. Final monitoring requirements for the area will be determined through coordination with regulatory agencies (including San Francisco, Caltrain and California High Speed Rail Authority (CHSRA)) and details will be included in the mitigation plan approved by the City and County of San Francisco. A minimum of two monitoring events of the compensatory mitigation will take place after implementation for the first six years after implementation (or until CHSRA serves San Francisco whichever comes first), and one monitoring event for three additional years is required. Additional monitoring after this time period may be necessary based on impacts and any adaptive management applied. After each monitoring event, a report will be submitted to the City and County of San Francisco which will include, but not be limited to, a narrative of the site conditions, representative analysis including traffic counts, gate down time, and delays, and the performance metrics included in the City and County of San Francisco-approved mitigation plan. *New-MM-TR-1.1 – Modify Signal Operations at the 16th Street Intersection with Seventh Street/Mississippi Street, the Caltrain tracks, and Owens Street.* If Caltrain's service and operations plan requires the use of the turnback track during the AM/PM peak hours in the future, prior to Caltrain making any such changes, the TJPA, in conjunction with Caltrain, shall conduct further traffic and train operation analysis of the turnback and maintenance of way tracks to evaluate traffic operations along 16th Street at Seventh/Mississippi Street, the Caltrain turnback track, and Owens 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/train operation analysis shows that the traffic delays attributable to the gate downtime during the AM/PM peak hours would increase at Seventh/Mississippi Street or at Owens Street (already operating at LOS E and F) such that the overall intersection v/c ratio would worsen by more than 10 percent (i.e., a v/c ratio increase of more than 0.10), then improvements shall be implemented so the resulting v/c ratio is no greater than 10 percent above the v/c ratio without use of the turnback track during the AM/PM peak hours. Actions or improvements that could achieve the performance standard, either individually or in combination, include but are not limited to: • Signal timing adjustments; • Signal phasing modifications; • Lane reconfiguration/re-striping in conjunction with phasing modification; • Left-turn pocket lengthening; • Pre-empt, pre-signal or queue cutters provision or modification as necessary to manage queues; and/or • Other improvements identified in the future due to technology advancement. The TJPA and Caltrain shall coordinate with the City and shall be responsible for reasonable costs of design, permitting, and construction of the necessary improvements at these crossings to attain the v/c performance standard. These changes to the crossing will also satisfy the performance standard for safe pedestrian and bicycle circulation identified in New-MM-TR-3.1.	No Adverse Effect/ Less-than-Significant Impact

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

Impact	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)
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.	*New-MM-TR-3.1 Modify 16th Street Intersection with the Caltrain and turnback track to provide a safe crossing for pedestrians and bicyclists.* At the time of the construction and operation of the proposed turnback track, the Caltrain electrification project (including mitigation measures adopted by Caltrain for this intersection), SFTMA's 22 Fillmore Transit Priority Project, and the Warriors Arena project may have been implemented. The combination of these projects will modify the intersection configuration and operation at the time of the proposed project. As a result, the TJPA is using a safety-based performance standard, explained below, to guide future improvements for pedestrian and bicyclist safety. At the time of final design, TJPA shall determine the then-current overall time required by pedestrians and bicyclists traveling along 16th Street to cross the Seventh Street/Mississippi Street intersection, the Caltrain mainline tracks, and the turnback track, and the TJPA shall coordinate and consult with Caltrain, the California Public Utilities Commission, and the City to identify the changes to the intersection and grade crossing warning devices, including signal timing, that are needed to provide adequate time, as determined by the Institute of Transportation Engineers, Caltrans, and the City, for pedestrians and bicyclists to safely cross the widened intersection that results from the construction of the turnback track. The TJPA shall commit to implementing changes necessary to protect pedestrians and bicyclists from potential safety issues, prior to operation of the new turnback track. Specific changes are expected to be determined during final design, which will be after the location of the crossing gates for the turnback track along 16th Street has been determined and based on the then-current signal timing at that time and which is expected to account for other major development and transit projects in the vicinity. The changes to the intersection due to the turnback track will be included in the design specifications for the project. Possible improvements that may attain the above performance standard include: • Adjust signal timing for the warning devices and adjacent traffic signals. The warning phase before the gates start to come down shall be extended to take into account the additional time needed for pedestrians and bicyclists to clear the track zone based on industry standards (such as the Caltrans California Manual on Uniform Traffic Control Devices or the Institute of Transportation Engineers' Design and Safety of Pedestrian Facilities) or City guidelines that define the walking speed of a pedestrian. • Provide sufficient refuge areas for pedestrians and bicyclists to wait while the crossing gates are down. The refuge, or waiting, area shall be sufficient to accommodate the projected pedestrians and bicyclists and be ADA compliant. • Install a smooth surface in the areas next to and between the rails to reduce tripping hazards and unintended forces on bicycle tires.	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-3.1*	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.

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

Impact	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)
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 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.	None required.	Not applicable.
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.

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

Impact	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)
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.
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	*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-TR-3.1* *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.	None required.	Not applicable.

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

Impact	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)
		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.		
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.

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

Impact	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)
3.6 Historic and Cultural Resources				
CR-1: The proposed project would not cause a substantial adverse change in the significance of archaeological resources because this potential effect would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement that include previously adopted mitigation measures for the Transbay Program.	No Adverse Effect/ Less-than-Significant Impact	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.		Not applicable.
CR-2: The proposed project would not cause direct adverse impacts on historic architectural resources, because such potential effects would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement that include previously adopted mitigation measures for the Transbay Program.	No Adverse Effect/ Less-than-Significant Impact	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 11 amended, to include 165-173 Second Street to the table of affected historic properties during construction CH 12 amended, to remove 165-173 Second Street.	Not applicable.
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.
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

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

Impact	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-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-1.1 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
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.

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

Impact	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)
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 flood hazards. Specifically, the TJPA shall design and construct Transbay Program Phase 2 within the area delineated as being within a 100-year floodplain 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 sufficient freeboard above the 100-year base flood elevation to protect the rail facilities and the public from 100-year storm water entering the stations and the tunnel. Changes to the design criteria will be completed prior to the next phase of design so that these standards can be incorporated into the 30 percent Preliminary Engineering design for DTX. In updating project designs to meet the modified DTX Design Criteria, the TJPA shall consider the cost-benefit of flood-proofing measures and designs which 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.
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

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

Impact	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-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 the City and County of San Francisco, 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 shall design 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 projected by the City for the year 2100. It is recognized that the projected 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 separately by agencies other than the TJPA, but that will also provide flood risk reduction 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 cooperation 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
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.	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	Not applicable.

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

Impact	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)
		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.	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).	
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 Groundwater Control during Construction.* Groundwater control shall be implemented to reduce ground instability in the construction area, where excavations encroach into the prevailing groundwater table. • For excavations with the cut-and-cover technique, the groundwater level within the footprint of the excavation shall be maintained a minimum of 2 feet or more beneath the bottom of the excavation throughout construction to minimize the potential for failure of the base of the excavation due to high groundwater seepage at construction sites. The groundwater level outside of the excavation footprint shall remain unchanged. • For excavations with the SEM construction method in rock, groundwater intrusion into the tunnel excavation is expected to be minimal and localized at joints in the rock. Groundwater seeping into the excavation shall be controlled locally by panning and piping channel inflows to sump pumps located in the portal area. • For excavations with the SEM construction method in soft ground conditions (i.e., sands and clays), the groundwater level shall be locally drawn down to below the bottom of the excavation in order to increase the strength of the ground and reduce potential ground instability.	No Adverse Effect/ Less-than-Significant 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	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.

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

Impact	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)
3.10 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 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.	None required.	Not applicable.

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

Impact	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)
		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 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 identified	No Adverse Effect/ Less-than-Significant Impact

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

Impact	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)
			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	None.	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. 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.	No additional feasible measures.	Adverse Effect/ Significant and Unavoidable Impact

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

Impact	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 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 would not result in construction vibration impacts, because this potential effect would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement with the SHPO that include previously approved preconstruction measures that will be implemented for the Transbay Program.	No Adverse Effect/ Less-than-Significant Impact	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.	None required.	Not applicable.
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	*NoiO 1 through 3* *VibO 1* *NoiC 1 through 6* *VibC 1 through 6*	None required.	Not applicable.

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

Impact	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)
3.13 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 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 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. AC 9 – minimize use of on-site diesel construction equipment, particularly unnecessary idling.	*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	No Adverse Effect/ Less-than-Significant Impact

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

Impact	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 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).	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). 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. **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 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.	

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

Impact	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)
			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*	*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.
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.

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

Impact	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)
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	*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.
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.

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

Impact	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-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.
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
Environmental Commitments Included as Part of the Project (Avoidance Measures)				
Modify as necessary the overhead catenary system of the Electronic Trolley Bus and Caltrain at the 16th Street crossing.				
Mitigate construction-related effects to the Caltrain station at Fourth and King and on the existing Caltrain support facilities, including administration and storage buildings, bike storage, employee parking, and crew facilities.				
Coordinate with SFMTA and enter into a Memorandum of Understanding (MOU), or similar agreement, to avoid impacts to the Muni T-Line (including the Central Subway project) during DTX construction. The MOU would identify construction phasing, sequencing, and timing that work for both agencies and minimize both delays to construction of the DTX, including the underground station at Fourth and Townsend, and disruption to T-Line operations.				
Design the ventilation structures with City input and in accordance with context sensitive design guidelines, which seek to preserve and enhance, to the extent feasible, scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure.				

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

Impact	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)

Notes:
[1] The full text of these mitigation measures is presented in Appendix D of this Final 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 INTRODUCTION TO THE FINAL SEIS/EIR

1.1 PURPOSE OF THE FINAL SEIS/EIR AND RECORD OF DECISION

The Federal Transit Administration (FTA), in cooperation with the Federal Railroad Administration (FRA) and the Transbay Joint Powers Authority (TJPA), have prepared a Final 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] The Transbay Program, approved in 2004, is divided into two construction phases. Phase 1 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 was completed and the Transit Center officially opened with the ribbon-cutting celebration in August 2018, although it is currently closed for repairs. 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 Downtown Rail Extension), and completion of the Transit Center below-grade levels for rail operations.

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 the 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. The Final SEIS/EIR also addresses comments received on the Draft SEIS/EIR that was issued in December 2015.

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 21000 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 the FTA and FHWA joint implementing regulation at 23 CFR Part 774. The SEIS/EIR was also prepared in accordance with provisions of Fixing America's Surface Transportation Act (FAST Act) signed into law on December 4, 2015; the federal public transportation law (49 USC Section 5301 et seq.); and efficient environmental reviews for project decisionmaking (23 USC 139 et seq.). 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.

The Draft SEIS/EIR for the Transbay Transit Center Program was made available for public review and comment on December 28, 2015. Copies of the Draft SEIS/EIR were provided to local, state, and federal agencies, and organizations and individuals (the full Distribution List is included in Chapter 10 of the Draft SEIS/EIR). A copy of the Draft SEIS/EIR was also posted on the TJPA website (http://transbaycenter.org). The Draft SEIS/EIR was made available for public review and comment for a period of 60 days that began on December 28, 2015 and ended on February 29, 2016. TJPA held a meeting to receive public comments

[1] In the Draft SEIS/EIR, 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.

on the Draft SEIS/EIR during the comment period on February 10, 2016. In total, 19 comment submissions (e.g., comment cards, e-mails, and letters) containing 140 individual comments were received. Following the close of the comment period on February 10, 2016, three additional comments letters containing 13 individual comments were received from individuals. Responses to these comments were incorporated into the Final SEIS/EIR (Chapter 2 and Appendix A).

This document is the Final SEIS/EIR and consists of the Draft SEIS/EIR (December 2015) and the revised sections of the Draft SEIS/EIR and responses to comments received during the Draft SEIS/EIR public review period). Draft SEIS/EIR sections not included in this Final SEIS/EIR remain unchanged and have not been republished. Sections that have been updated are included in this document in Chapter 2.

The Final SEIS/EIR 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* providing notice of its approval of the proposed project.

Similarly, for NEPA, this Final Supplemental Environmental Impact Statement (SEIS) was prepared in accordance with 23 CFR 771.125 and FTA published a Notice of Availability in the Federal Register. FTA issued a *Record of Decision* (ROD) for the Transbay Program in 2005 that described the findings of the Final EIS and the rationale for its decision. Pursuant to Public Law 112-141, 126 Stat. 405, Section 13 1 9(b), the FTA can issue a single Final SEIS/ROD document unless the FTA determines statutory criteria or practicability considerations preclude issuance of the combined document. For this project, the Transbay Transit Center Program, after the consideration of comments received during and after the circulation of the Draft SEIS, FTA determined that practicality considerations preclude the issuance of a combined Final SEIS/ROD. Therefore, FTA has issued this Final SEIS for a 30-day public review, to be followed by an amended Record of Decision.

1.2 ORGANIZATION OF THE FINAL SEIS/EIR

The Final SEIS/EIR is organized into the following sections:

- **Chapter 1 Introduction to the Final SEIS/EIR** – this chapter describes the contents of this document and explains that the Final SEIS/EIR includes the Draft SEIS/EIR, as amended, plus responses to comments on the Draft SEIS/EIR.

- **Chapter 2 Updated Sections from Draft SEIS/EIR** – this chapter includes subsections or entire chapters of the Draft SEIS/EIR that have been revised based on responses to comments received during the Draft SEIS/EIR public review period or that have been updated based on resource agency concurrences. As explained earlier, subsections or chapters that are unchanged from the Draft SEIS/EIR have not been reprinted.

- **Appendix A Responses to Comments** – this appendix includes copies of the comments received on the Draft SEIS/EIR and responses to these comments. The responses are presented as both master responses (responses that address similar comments from multiple commenters) and individual responses to each commenter.

- **Appendix B National Historic Preservation Act – Section 106 Continuing Consultation** – this appendix includes the final finding of effect related to Section 106 of the National Historic Preservation Act. Appendix B also includes the letter from FTA to the State Historic Preservation Officer (SHPO) regarding the finding of effect, and the letter from SHPO concurring with the finding of effect.

- **Appendix C Transportation Analysis Supplement –** this appendix provides a description of the methodology and the worksheets used to prepare the analysis of transportation impacts presented in Section 3.2, Transportation, of the Draft SEIS/EIR.

- **Appendix D 2018 Final SEIS/EIR Mitigation Measures and Monitoring Program** – this appendix includes an updated version of the list of mitigation measures and the Mitigation Monitoring and Reporting Program (MMRP) from the 2004 Final EIS/EIR based on new and revised mitigation measures from the Final SEIS/EIR.

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CHAPTER 2 UPDATED SECTIONS FROM DRAFT SEIS/EIR

2.1 INTRODUCTION

Text changes to the Draft SEIS/EIR have been identified in response to comments on the Draft SEIS/EIR (see Appendix A of this document). These text changes are incorporated into the relevant sections of the Draft SEIS/EIR beginning in the following section based on the order that they appear in the Draft SEIS/EIR, and with the same subheadings and numbering (tables, figures, and subheadings) as the Draft SEIS/EIR. The text revisions are presented here using ~~strikethrough~~ to indicate deleted text and underlining to indicate added text. Draft SEIS/EIR text that is not included in this chapter of the Final SEIS/EIR remains unchanged from the Draft SEIS/EIR and has not been reprinted. The Draft SEIS/EIR is hereby incorporated by reference.

Table 2-1 below identifies each section of the Draft SEIS/EIR, whether it has been revised, and the primary revisions made to the text.

Table 2-1
Revised Chapters/Section from the Draft SEIS/EIR

Draft SEIS/EIR Section	Title	Revised and Included in this Chapter	Primary Revisions
Summary			
Summary (except Tables S-1 and S-2)	Summary	No	N/A
Table S-1	Proposed Project	**YES (see Section 2.2)**	Clarify location of realigned Fourth and Townsend Street station
Table S-2	Summary of Proposed Project Impacts and Mitigation Measures	**YES (see Section 2.2)**	Reflect changes made to other sections, include environmental commitments
Chapter 1 Purpose and Need for the Project			
Chapter 1 (except Section 1.2.3)	Purpose and Need for the Project	No	N/A – same as Draft SEIS/EIR
Section 1.2.3	Need for the Proposed Project	**YES (see Section 2.3)**	Include additional information on the need for the project
Chapter 2 Project Alternatives			
Section 2.1	Project History and Overview	No	N/A – same as Draft SEIS/EIR
Section 2.2	Description of the Project Alternatives	**YES (see Section 2.4)**	Clarify details of No Action Alternative and proposed project, particularly related to use of the turnback track
Section 2.3	Operations	No	N/A – same as Draft SEIS/EIR

Table 2-1
Revised Chapters/Section from the Draft SEIS/EIR

Draft SEIS/EIR Section	Title	Revised and Included in this Chapter	Primary Revisions
Section 2.4	Alternatives Previously Considered and Rejected for Further Review	**YES (see Section 2.5)**	Clarify rationale for rejection of project alternatives from further consideration
Chapter 3 Affected Environment, Consequences, and Mitigation Measures			
Section 3.1 (except Section 3.1.4)	Introduction	No	N/A – same as Draft SEIS/EIR
Section 3.1.4	Differences between CEQA and NEPA	**YES (see Section 2.6)**	Incorporate additional information in the cumulative list of plans and projects
Section 3.2	Transportation	**YES (see Section 2.7)**	Update information on impact methodology and impacts; clarify mitigation measures; add a new improvement measure; assess other construction methods
Section 3.3 (except Section 3.3.2)	Land Use and Planning, Wind, and Shadow	No	N/A – same as Draft SEIS/EIR
Section 3.3.2	Land Use and Planning, Wind, and Shadow Affected Environment	**YES (see Section 2.8)**	Provide description of additional relevant planning documents in the southern portion of the project limits, around Mission Bay
Section 3.4 (except Section 3.4.3)	Socioeconomics, Population, and Housing	No	N/A – same as Draft SEIS/EIR
Section 3.4.3	Socioeconomics, Population, and Housing Environmental Consequences and Mitigation	**YES (see Section 2.9)**	Update jobs displacement information; assess other construction methods
Section 3.5 (except Section 3.5.3)	Visual Quality/Aesthetics	No	N/A – same as Draft SEIS/EIR
Section 3.5.3	Visual Quality/Aesthetics Environmental Consequences and Mitigation	**YES (see Section 2.10)**	Assess other construction methods
Section 3.6	Historic and Cultural Resources	**YES (see Section 2.11)**	Incorporate information and analysis from consultation with the State Historic Preservation Officer, including acknowledgment that 2004 Memorandum of Agreement with the State

Table 2-1
Revised Chapters/Section from the Draft SEIS/EIR

Draft SEIS/EIR Section	Title	Revised and Included in this Chapter	Primary Revisions
			Historic Preservation Officer identifies preventative and protective measures that will apply to the proposed project
Section 3.7	Biological Resources	No	N/A – same as Draft SEIS/EIR
Section 3.8 (except Sections 3.8.2 and 3.8.3)	Water Resources and Water Quality	No	N/A – same as Draft SEIS/EIR
Section 3.8.2	Water Resources Affected Environment	**YES (see Section 2.12)**	Add information that Executive Order 13690 was rescinded
Section 3.8.3	Water Resources Environmental Consequences and Mitigation	**YES (see Section 2.12)**	Clarify text of the mitigation measures; assess other construction methods
Section 3.9 (except Section 3.9.3)	Geology, Soils, and Seismicity	No	N/A – same as Draft SEIS/EIR
Section 3.9.3	Geology, Soils, and Seismicity Environmental Consequences and Mitigation	**YES (see Section 2.13)**	Clarify text of a mitigation measure; assess other construction methods
Section 3.10	Hazardous Materials	No	N/A – same as Draft SEIS/EIR
Section 3.11 (except Section 3.11.3)	Electromagnetic Fields	No	N/A – same as Draft SEIS/EIR
Section 3.11.3	Electromagnetic Fields Environmental Consequences and Mitigation Measures	**YES (see Section 2.14)**	Make editorial change to a mitigation measure
Section 3.12 (except Sections 3.12.3 and 3.12.4)	Noise and Vibration	No	N/A – same as Draft SEIS/EIR
Section 3.12.3	Environmental Consequences and Mitigation Measures	**YES (see Section 2.15)**	Acknowledge that 2004 Memorandum of Agreement with the State Historic Preservation Officer identifies preventative and protective measures that will apply to the proposed project; assess other construction methods
Section 3.12.4	Noise and Vibration Summary of Proposed Project Effects/Impacts		

Table 2-1
Revised Chapters/Section from the Draft SEIS/EIR

Draft SEIS/EIR Section	Title	Revised and Included in this Chapter	Primary Revisions
Section 3.13 (except Section 3.13.3)	Air Quality	No	N/A – same as Draft SEIS/EIR
Section 3.13.3	Air Quality Environmental Consequences and Mitigation Measures	**YES (see Section 2.16)**	Clarify text of a mitigation measure and update text on regional conformity; assess other construction methods
Section 3.14 (except Section 3.14.2)	Greenhouse Gases and Climate Change	No	N/A – same as Draft SEIS/EIR
Section 3.14.2	Greenhouse Gases and Climate Change Affected Environment	**YES (see Section 2.17)**	Add footnote regarding rescinding of Council on Environmental Quality Guidelines on greenhouse gases
Section 3.15	Public Services, Community Services, and Recreational Facilities	No	N/A – same as Draft SEIS/EIR
Section 3.16	Safety and Security	No	N/A – same as Draft SEIS/EIR
Section 3.17 (except Section 3.17.3)	Utilities	No	N/A – same as Draft SEIS/EIR
Section 3.17.3	Utilities Environmental Consequences and Mitigation	**YES (see Section 2.18)**	Assess other construction methods
Section 3.18	Environmental Justice Communities	**YES (see Section 2.19)**	Update data; clarify assessment of disproportionately high and adverse effects; reflect changes made to other sections
Chapter 4	**Financial Considerations/Evaluation of Alternatives**	No	N/A – same as Draft SEIS/EIR
Chapter 5	**Other CEQA/NEPA Considerations**	No	N/A – same as Draft SEIS/EIR
Chapter 6	**Section 4(f) Evaluation**	**YES (see Section 2.20)**	Incorporate information and analysis from consultation with the State Historic Preservation Officer

Table 2-1
Revised Chapters/Section from the Draft SEIS/EIR

Draft SEIS/EIR Section	Title	Revised and Included in this Chapter	Primary Revisions
Chapter 7 Coordination and Consultation			
Chapter 7 (except Sections 7.6 and 7.7)	Coordination and Consultation	No	N/A – same as Draft SEIS/EIR
Section 7.6	Consultations Pursuant to Federal Acts and Environmental Legislation	**YES (see Section 2.21)**	Incorporate information and analysis from consultation with the State Historic Preservation Officer
Section 7.7	Summary of Public Involvement and Next Steps	**YES (see Section 2.21)**	Update activities since release of the Draft SEIS/EIR
Chapter 8	**References**	**YES (see Section 2.22)**	Reflect new citations added to other sections

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2.2 UPDATED TABLE S-1, PROPOSED PROJECT AND TABLE S-2, SUMMARY OF PROPOSED PROJECT IMPACTS AND MITIGATION MEASURES

Table S-1, Proposed Project, is reproduced in its entirety with text revisions to further clarify details about the proposed project components.

Table S-2, Summary of Proposed Project Impacts and Mitigation Measures, is reproduced in its entirety with text revisions based on comments received on the Draft SEIS/EIR on the following pages. Previously adopted mitigation measures from the 2004 FEIS/EIR and ROD apply to the project and are shown in Table S-2 under the column titled "Previously Adopted Mitigation Measures" (third column in the table). It was because of these previously approved mitigation measures, which will be implemented as part of the Transbay Program, that many of the impacts of the proposed project would be not adverse under NEPA and less than significant under CEQA. The list of previously adopted mitigation measures in Table S-2 is not a complete list of the mitigation measures from the 2004 FEIS/EIR, but rather includes all of the previously adopted mitigation measures from the 2004 FEIS/EIR that are relevant to the proposed project. The proposed project, however, would require new mitigation measures, in addition to those previously adopted and incorporated into the Transbay Program, to address adverse effects/ significant impacts. These mitigation measures are identified in Table S-2 under the column titled "Additional Proposed New Mitigation Measures" (fourth column in the table). Revisions to mitigation measures from the Draft SEIS/EIR are shown in ~~strikethrough~~ to indicate deleted text and <u>underlining</u> to indicate added text. At the end of Table S-2, environmental commitments are listed that are included as part of the project to avoid environmental impacts and would be implemented by the TJPA.

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 <u>occur below grade and within the</u> ~~parallel~~ Townsend Street <u>right-of-way</u>.	• 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. 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

Table S-1
Proposed Project

Proposed Project Components	Change from the Approved Transbay Program
	have also changed to account for type and height of adjacent uses at the new locations.
• **Vent structures** – Emergency ventilation/smoke evacuation structures would be co-located with emergency tunnel exits at the following locations: o Fourth and Townsend Street Station, one at each end o ~~701 Third Street (Third and Townsend Streets) or across the street at~~ 699 Third Street and 180 Townsend Street o Second and Harrison Streets (southeast corner) o 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.	
• **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. <u>The proposed project adds this trackwork needed for operations and maintenance.</u>
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 <u>to construct an intercity bus facility</u>.
• **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 <u>include a ramp to</u> 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	• *New component.* The approved design includes a bus storage area for AC Transit. The proposed project would

Table S-1
Proposed Project

Proposed Project Components	Change from the Approved Transbay Program
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.	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 up to 65 feet in height at the northeast corner of the site ~~option up to 65 feet tall~~.	• *New component.* The approved Transbay Program did not include any new development at Third and Townsend Streets. The proposed project would support City goals to increase housing and other types of development consistent with area plans and zoning.

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

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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, or cause major traffic hazards.	No Adverse Effect/ Less-than-Significant Impact with Mitigation	None.	*New-I-TR-1.1 Traffic Improvement and Adaptive Management Plan*. A traffic improvement plan and adaptive management plan will be developed for the two at-grade intersections along the turn-back track length (7th/Mission Bay Drive and 16th Street/Mississippi Street/7th Street) which will outline all aspects of avoiding, minimizing, and compensating for all temporary and permanent impacts associated with the project. The traffic improvement plan will be reviewed and approved by the City and County of San Francisco prior to implementation. Final monitoring requirements for the area will be determined through coordination with regulatory agencies (including San Francisco, Caltrain and California High Speed Rail Authority (CHSRA)) and details will be included in the improvement plan approved by the City and County of San Francisco. A minimum of two monitoring events of the compensatory mitigation will take place after implementation for the first six years after implementation (or until CHSRA serves San Francisco whichever comes first), and one monitoring event for three additional years is required. Additional monitoring after this time period may be necessary based on impacts and any adaptive management applied. After each monitoring event, a report will be submitted to the City and County of San Francisco which will include, but not be limited to, a narrative of the site conditions, representative analysis including traffic counts, gate down time, and delays, and the performance metrics included in the City and County of San Francisco-approved mitigation plan. *New-MM-TR-1.1 Modify Signal Operations at the 16th Street Intersection with* Seventh Street/Mississippi Street, *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~~ If Caltrain's service and operations plan requires the use of the turnback track during the AM/PM peak hours in the future, prior to Caltrain making any such changes, the TJPA, in conjunction with Caltrain, shall conduct further traffic and train operation analysis of the turnback and maintenance of way tracks to evaluate traffic~~, pedestrian, and bicycle~~ operations along 16th Street at Seventh/Mississippi Street, the Caltrain ~~/~~turnback track~~s~~, and Owens 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/train operation analysis shows that the traffic delays attributable to the gate downtime during the AM/PM peak hours would increase at Seventh/Mississippi Street or at Owens Street (already operating at LOS E and F) such that the overall intersection v/c ratio would worsen by more than 10 percent (i.e., a v/c ratio increase of more than 0.10), then improvements shall be implemented so the resulting v/c ratio is no greater than 10 percent above the v/c ratio without the use of the turnback track during the AM/PM peak hours. Actions or improvements that could achieve the performance standard, either individually or in combination, include but are not limited to: • Signal timing adjustments; • Signal phasing modifications; • Lane reconfiguration/re-striping in conjunction with phasing modification; • Left-turn pocket lengthening; • Pre-empt, pre-signal or queue cutters provision or modification as necessary to manage queues; and/or • Other improvements identified in the future due to technology advancement. ~~the intersections along 16th Street do not meet the City's service levels for automobile traffic and pedestrian and bicycle circulation, t~~The TJPA and Caltrain ~~will~~ shall coordinate with the City and ~~will~~ shall be responsible for reasonable costs of design, permitting, and construction of the ~~implementing~~ necessary ~~changes~~ improvements at these crossings to attain the v/c performance standard ~~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~~	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)
			~~bicyclists; and avoid creation of potentially hazardous conditions for pedestrians and bicyclists.~~ These changes to the crossing will also satisfy the performance standard for safe pedestrian and bicycle circulation identified in New-MM-TR-3.1.	
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.	*New-MM-TR-3.1 Modify 16th Street Intersection with the Caltrain and turnback track to provide a safe crossing for pedestrians and bicyclists.* At the time of the construction and operation of the proposed turnback track, the Caltrain electrification project (including mitigation measures adopted by Caltrain for this intersection), SFTMA's 22 Fillmore Transit Priority Project, and the Warriors Arena project may have been implemented. The combination of these projects will modify the intersection configuration and operation at the time of the proposed project. As a result, the TJPA is using a safety-based performance standard, explained below, to guide future improvements for pedestrian and bicyclist safety. At the time of final design, TJPA shall determine the then-current overall time required by pedestrians and bicyclists traveling along 16th Street to cross the Seventh Street/Mississippi Street intersection, the Caltrain mainline tracks, and the turnback track, and the TJPA shall coordinate and consult with Caltrain, the California Public Utilities Commission, and the City to identify the changes to the intersection and grade crossing warning devices, including signal timing, that are needed to provide adequate time, as determined by the Institute of Transportation Engineers, Caltrans, and the City, for pedestrians and bicyclists to safely cross the widened intersection that results from the construction of the turnback track. The TJPA shall commit to implementing changes necessary to protect pedestrians and bicyclists from potential safety issues, prior to operation of the new turnback track. Specific changes are expected to be determined during final design, which will be after the location of the crossing gates for the turnback track along 16th Street has been determined and based on the then-current signal timing at that time and which is expected to account for other major development and transit projects in the vicinity. The changes to the intersection due to the turnback track will be included in the design specifications for the project. Possible improvements that may attain the above performance standard include: • Adjust signal timing for the warning devices and adjacent traffic signals. The warning phase before the gates start to come down shall be extended to take into account the additional time needed for pedestrians and bicyclists to clear the track zone based on industry standards (such as the Caltrans California Manual on Uniform Traffic Control Devices or the Institute of Transportation Engineers' Design and Safety of Pedestrian Facilities) or City guidelines that define the walking speed of a pedestrian. • Provide sufficient refuge areas for pedestrians and bicyclists to wait while the crossing gates are down. The refuge, or waiting, area shall be sufficient to accommodate the projected pedestrians and bicyclists and be ADA compliant. • Install a smooth surface in the areas next to and between the rails to reduce tripping hazards and unintended forces on bicycle tires.	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-~~3~~.1*	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)
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 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.	None required.	Not applicable.
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.

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)
3.3 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.
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-TR-3.1* *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

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-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.
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.

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)
3.6 Historic and Cultural Resources				
CR-1: The proposed project ~~e~~would not cause a substantial adverse change in the significance of archaeological resources ~~pursuant to Section 15064.5 of the CEQA Guidelines, but~~ because this potential effect would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement that include ~~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~~ Not applicable.
CR-2: The proposed project ~~e~~would not cause direct adverse impacts on historic architectural resources, ~~but this~~ because such potential effects would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement that include ~~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 11 amended, to include 165-173 Second Street to the table of affected historic properties during construction 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~~ Not applicable.
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.
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

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-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-1.1 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
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.

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)
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<u>s</u>. Specifically, the TJPA shall design and construct Transbay Program Phase 2 within the area delineated as being within a <u>100-year</u> 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~~ <u>sufficient</u> freeboard above the 100-year base flood elevation <u>to protect the rail facilities and the public from 100-year storm water entering the stations and the tunnel</u>. Changes to the design criteria will be completed prior to the next phase of design so that these ~~new~~ standards can be incorporated in<u>to</u> the ~~design of the next phase.~~ <u>30 percent Preliminary Engineering design for DTX.</u> In updating project designs to meet the modified DTX Design Criteria, the TJPA shall consider the cost-benefit of flood-proofing measures and designs which 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.
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

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-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.,~~ the 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 shall design~~s~~ 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 projected 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 separately by agencies other than ~~separate from~~ the TJPA, but that will also provide flood~~ing~~ risk reduction 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~~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~~ cooperation 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
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.

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)
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 Groundwater Control during Construction~~Dewatering at the Extended Train Box and Transit Center Vent Structures Sites~~.* Groundwater control shall be implemented to reduce ground instability in the construction area, where excavations encroach into the prevailing groundwater table~~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~~. • For excavations with the cut-and-cover technique, the groundwater level within the footprint of the excavation shall be maintained a minimum of 2 feet or more beneath the bottom of the excavation throughout construction to minimize the potential for failure of the base of the excavation due to high groundwater seepage at construction sites. The groundwater level outside of the excavation footprint shall remain unchanged. • For excavations with the SEM construction method in rock, groundwater intrusion into the tunnel excavation is expected to be minimal and localized at joints in the rock. Groundwater seeping into the excavation shall be controlled locally by panning and piping channel inflows to sump pumps located in the portal area. • For excavations with the SEM construction method in soft ground conditions (i.e., sands and clays), the groundwater level shall be locally drawn down to below the bottom of the excavation in order to increase the strength of the ground and reduce potential ground instability.	No Adverse Effect/ Less-than-Significant Impact

Table S-2
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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.

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-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 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.	None required.	Not applicable.
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.

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)
3.11 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 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.	No Adverse Effect/ Less-than-Significant 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	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.	*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

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)
		• 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.		
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.	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. 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.	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)
		• 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 ~~c~~would not result in construction vibration impacts, ~~but~~ because this potential effect would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement with the SHPO that include previously approved ~~by proposed~~ preconstruction measures that will be implemented for the Transbay Program ~~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).~~ None required.	~~No Adverse Effect/ Less-than-Significant Impact~~ Not applicable.
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*~~ None required.	~~No Adverse Effect/ Less-than-Significant Impact~~ Not applicable.
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.	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)
			New-MM-AQ-3.2 Require and Implement Ventilation Plans for Proposed Residential Land Development. For residential development at the intercity bus facility or ventilation ~~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.	
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. 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.	*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~~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	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 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).	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, 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~~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.

Table S-2
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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)
			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~~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.
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.

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-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.
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.

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)
3.17 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.
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
Environmental Commitments Included as Part of the Project (Avoidance Measures)				
Modify as necessary the overhead catenary system of the Electronic Trolley Bus and Caltrain at the 16th Street crossing.				
Mitigate construction-related effects to the Caltrain station at Fourth and King and on the existing Caltrain support facilities, including administration and storage buildings, bike storage, employee parking, and crew facilities.				
Coordinate with SFMTA and enter into a Memorandum of Understanding (MOU), or similar agreement, to avoid impacts to the Muni T-Line (including the Central Subway project) during DTX construction. The MOU would identify construction phasing, sequencing, and timing that work for both agencies and minimize both delays to construction of the DTX, including the underground station at Fourth and Townsend, and disruption to T-Line operations.				
Design the ventilation structures with City input and in accordance with context sensitive design guidelines, which seek to preserve and enhance, to the extent feasible, scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure.				

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)

Notes:
[1] The full text of these mitigation measures is presented in Appendix DC of this Final 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

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2.3 UPDATED SECTION 1.2.3, NEED FOR THE PROPOSED PROJECT

Section 1.2.3, Need for the Proposed Project, as amended based on comments received on the Draft SEIS/EIR and to include references to various state and local propositions is reproduced below.

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 the goals of ~~continued~~ improving 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. In 1999, the voters of San Francisco approved Proposition H, and the San Francisco Board of Supervisors then adopted Resolution No. 165-99 implementing Proposition H. Proposition H requires the prompt extension of Caltrain from its present terminus at Fourth and Townsend Streets to what is now the site of the Transbay Transit Center connecting Caltrain, bus lines, Muni, HSR, and BART; protection of the Caltrain right-of-way from any conflicting use or development; and pursuit of electrification of Caltrain prior to or concurrent with extension of Caltrain downtown (Proposition H; San Francisco Board of Supervisors 1999). In 2003, San Francisco voters approved a ½ cent sales tax for 30 years to fund transportation improvements, including extending Caltrain to the Transbay Transit Center. 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). In 2008, California voters passed Proposition 1A, which called for the sale of bonds to fund construction of a high-speed train system that connects the San Francisco Transbay Terminal to Los Angeles Union Station, with support from 80 percent of San Francisco voters. In 2010, over 80 percent of San Francisco voters voted for making the Transbay Transit Center the northern terminus of the HSR line from Los Angeles to San Francisco (Proposition G; Ballotpedia 2017). 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. Currently, two tracks are dedicated for Caltrain and the remaining four for HSR trains; however, pending a future agreement among the operators, the tracks and platforms may be shared by Caltrain and HSR trains. An illustrative image of the proposed loading platforms is presented ~~below~~to the right. 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 8,000 more~~3,490~~ residential units, ~~5,563,700 commercial square feet,~~ and over 30,000~~27,820~~ new jobs (City of San Francisco 201~~63~~).

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 November 1999, the voters of San Francisco approved Proposition H, which requires the prompt extension of Caltrain from its present terminus at Fourth and Townsend Streets to the site of the Transbay Transit Center. Proposition H also calls for no conflicting use or development of the Caltrain extension right-of-way. 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, and standards governing the siting and design of these structures have been updated. 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.

2.4 UPDATED SECTION 2.2, DESCRIPTION OF THE PROJECT ALTERNATIVES

Section 2.2, Description of the Project Alternatives, as amended to reflect comments on the Draft SEIS/EIR and updated information from Caltrain, is reproduced below.

2.2 DESCRIPTION OF THE PROJECT ALTERNATIVES

The Transbay Program has a long history extending back to the 1990s, which involved examination of multiple alternatives including consideration of various alternative alignments for the DTX, along with alternatives to other components of the Transbay Program. The comprehensive EIS/EIR that was completed in 2004 fulfilled NEPA and CEQA requirements to examine a reasonable range of alternatives. Approval of the Transbay Program followed certification of the Final EIS/EIR in 2004 and the Record of Decision was issued by FTA in 2005. Appendix B of the Draft SEIS/EIR describes the history of the alternatives considered, evaluated, and withdrawn from further analysis, and provides the public with an overview to the alternatives previously evaluated.

Both NEPA and CEQA require consideration of alternatives. 40 CFR Section 1502.14 explains that the alternatives section is the heart of the EIS and requires a rigorous exploration and objective evaluation of all reasonable alternatives. Reasonable alternatives are considered those that are practical or feasible from the technical and economic standpoint and based on common sense. State CEQA Guidelines Section 15126.6 requires an EIR to discuss a reasonable range of alternatives that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. Neither NEPA nor CEQA require consideration of unreasonable or infeasible 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 completed ~~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.

Under CEQA, alternatives to individual project components (i.e., individual proposed refinements) are not required, because they are components of the whole of the action and alternatives should address the entire project. There is no other reasonable alternative to the whole of the proposed project that would achieve most of the basic project objectives. NEPA requires that alternatives be examined to lessen the environmental impacts which may result from a particular refinement or component of the project. In accordance with 23 CFR 771.130(f), a supplemental EIS addresses issues of limited scope, such as the extent of proposed mitigation or the evaluation of location or design variations for a limited portion of the overall project. This SEIS/EIR has been prepared to determine whether the proposed changes to Phase 2 of the approved Transbay Program may result in significant adverse effects, and whether new information since approval of the program in 2005 would result in significant environmental impacts not previously evaluated. Impact areas or project elements that are unchanged do not need to be addressed in the

supplemental document, but instead can be incorporated by reference and the document itself should focus on the environmental impacts that have changed because of the project changes. Because this SEIS/EIR examines discrete individual refinements or additions to the previously approved Transbay Program, full-scale alternatives to the Transbay Program are not considered.

This Final SEIS/EIR assesses other construction methods for segments of the DTX alignment that could lessen potential environmental impacts. In response to public comments, the TJPA completed a 2017 Tunnel Options Study that identified several construction techniques that could be feasible. These other potentially feasible construction methods have been evaluated as part of the proposed project in this Final SEIS/EIR. Other suggestions and comments to consider alternatives to individual project components have been made throughout this environmental review process. Section 2.4 at the end of this chapter describes these proposals and the reasons that they have been rejected from further consideration. These alternatives to individual project components were rejected because they would not substantially reduce adverse impacts and in some cases would result in greater impacts than those of the proposed project, or because they would not satisfy the purpose and need and objectives presented in Chapter 1.

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~~1~~2 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 end of the additional trackwork south of the railyard to the Transit Center is approximately 2.7 miles; the length 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 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.

[3] The total project length is 2.7 miles from the end of the turnback track at Mariposa Street ~~2 miles from the western end of the Caltrain railyard~~ to the eastern end of the train box. Excluding the turnback segment, which is about 0.5 mile, the 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.

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.

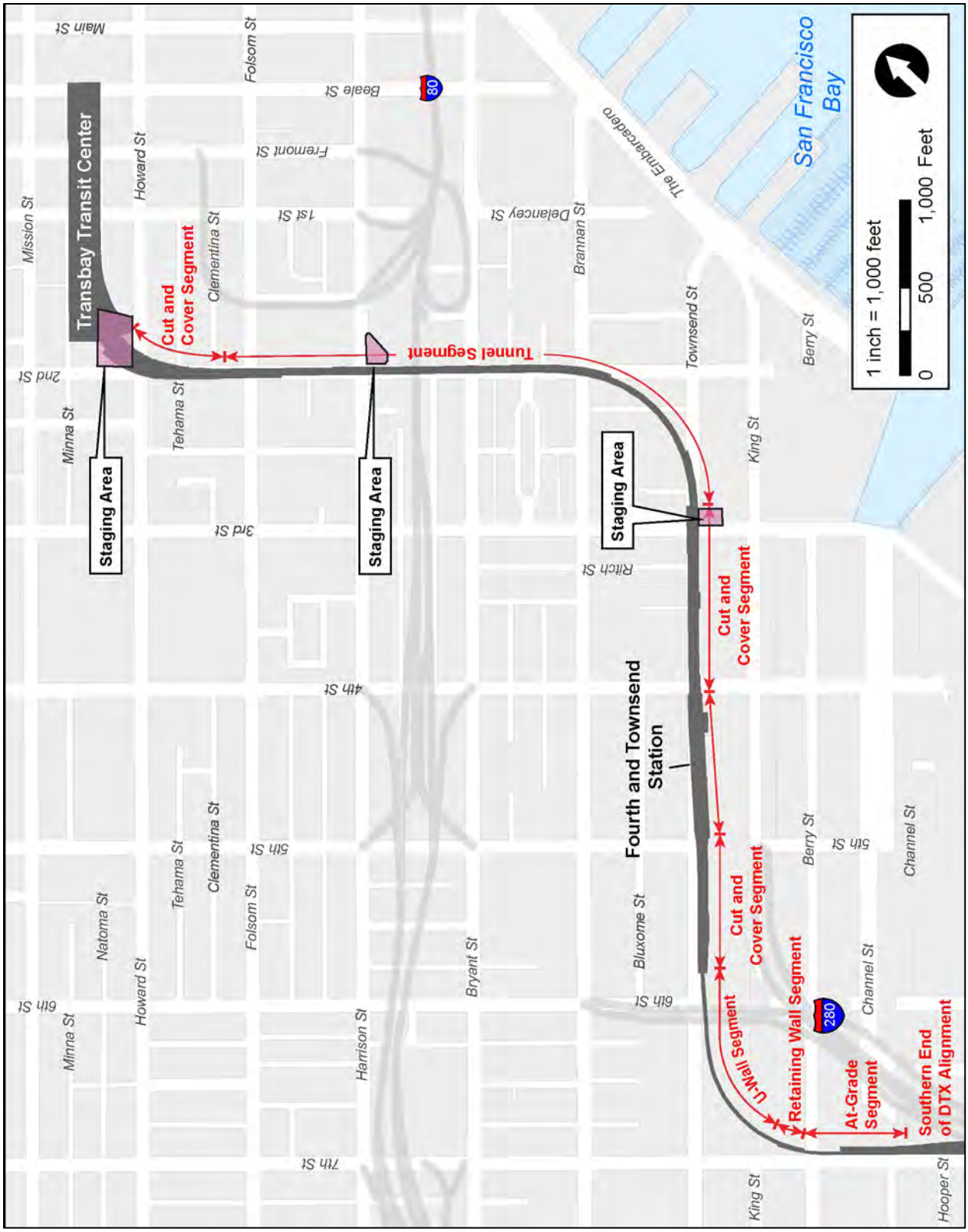
As the three-track system enters the throat structure to connect to the train box in the lower levels of the Transit Center, it will split to six tracks to accommodate the three loading platforms within the Transit Center. The eastern end of the train box at Beale Street represents the eastern project 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. The extent of cut-and-cover construction for the DTX is approximately 3,000 feet along Townsend Street, between Sixth Street and Clarence Place, about 700 feet along Second Street for the widened throat structure, and about 800 feet along Beale Street for the underground BART/Muni pedestrian connector. Regardless of the particular cut-and-cover construction technique used, the proposed approach to constructing the DTX alignment, including the Fourth and Townsend Station, would be to install excavation support, cut open the street surface, excavate to a depth to allow work to continue below the decking, and then construct traffic decking so that street level activities can be restored and construction can continue. In addition, the construction along Townsend Street would be phased and sequenced in order to reduce impacts to traffic movements, circulation by bicycles and pedestrians, and property access. ~~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.~~

Tunnel Construction. ~~Because the geology in the tunnel section is fractured rock and not suitable for standard tunnel boring machines,~~ In the mined tunnel section, ~~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,



Source: TJPA 2010a

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

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.

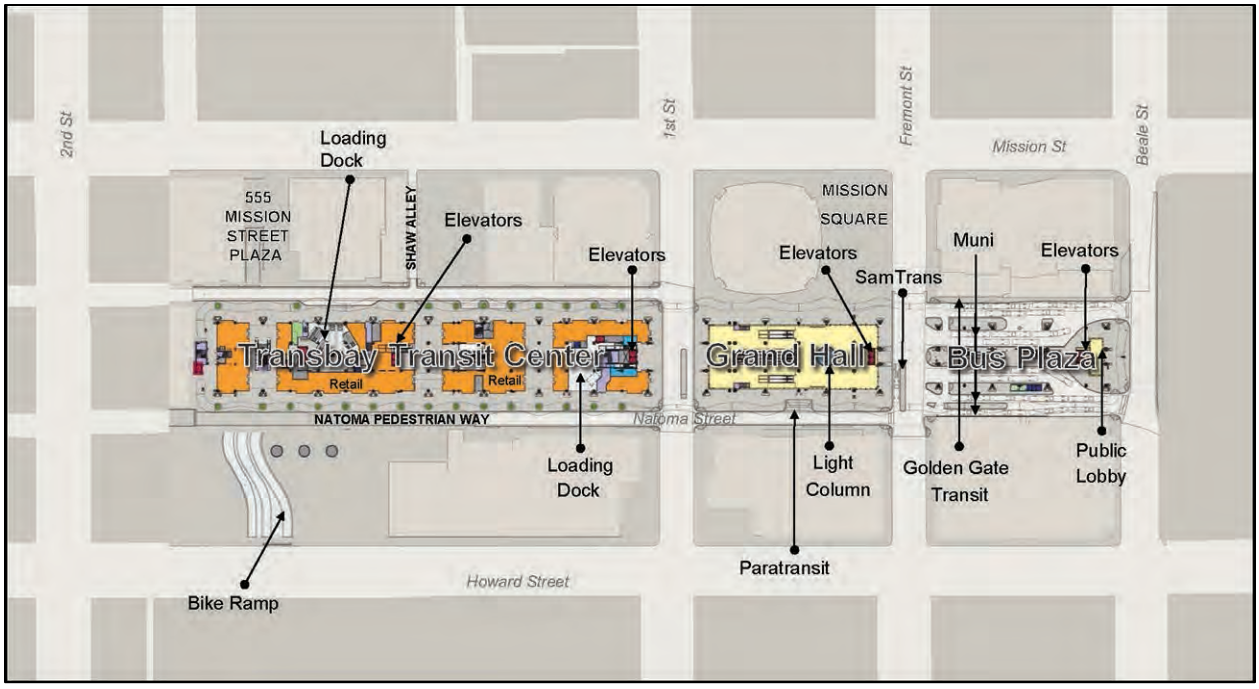
Chapter 24 – Electrical Systems – presents the design criteria for electrical design of all DTX facilities, including requirements for materials and performance standards, electrical equipment and wiring, lighting, and grounding and power for tunnel operating systems (with the exception of traction electrification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

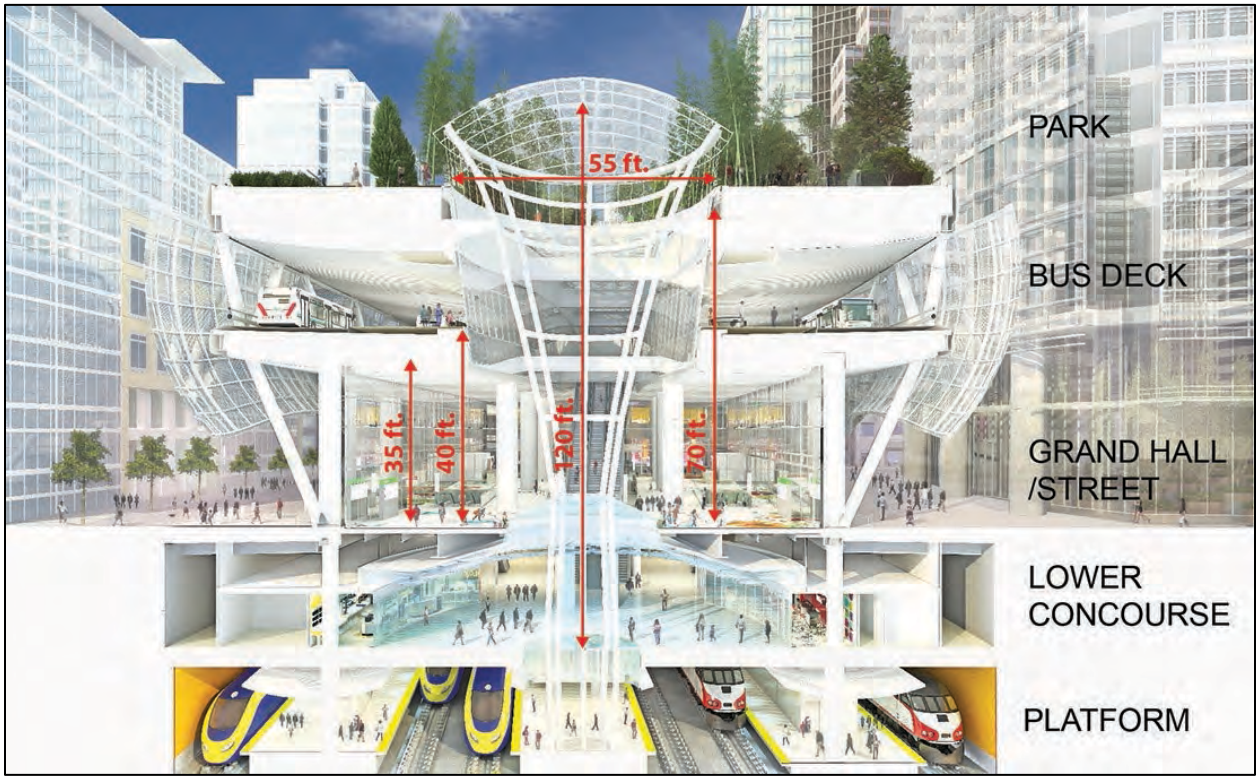
The Transit Center ~~currently under construction~~ as Phase 1 of the Transbay Program will serve as a regional transit hub connecting 11 transportation systems, including public and private bus services, Caltrain, and future HSR services. The "Grand Central Station of the West" will encompass more than 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~~ were completed in ~~2017~~2018. Uses and functions to operate the Transit Center ~~will be~~ were 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~~ houses two below-ground levels in the train box and three above-ground levels (see Figure 2-3b):

- 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.



Source: TJPA 2013a

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



Source: TJPA 2013a

Figure 2-3b Transit Center Cross Section

- 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, and Greyhound bus operations.

- At the Ground level, the Transit Center ~~will~~ features 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~~ is included. At the eastern end, between Fremont and Beale Streets, an outdoor bus plaza ~~will~~ serves Muni, Golden Gate Transit, and SamTrans.

- The floor above the Ground level is the Bus Deck level ~~that will~~ serveing AC Transit ~~and private bus operators such as Greyhound~~. The bus deck is designed as a loop ~~that will~~ surrounding a central passenger waiting area. At the western end of the Transit Center, the Bus Deck level ~~will~~ connects 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~~ offers 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, wereare ~~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~~ 2016 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 2016 Business Plan identifies the initial operating segment to the Central Valley to Silicon Valley (San Jose) line. The 2016 Business Plan also advocates extending the initial operating segment to provide a one-seat ride between San Francisco and Bakersfield as soon as possible. By 2029, the 2016 Business Plan anticipates completion of the DTX and HSR service extending to the Transit Center.

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~~ has been constructed 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~~ was also ~~be located~~ constructed 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.

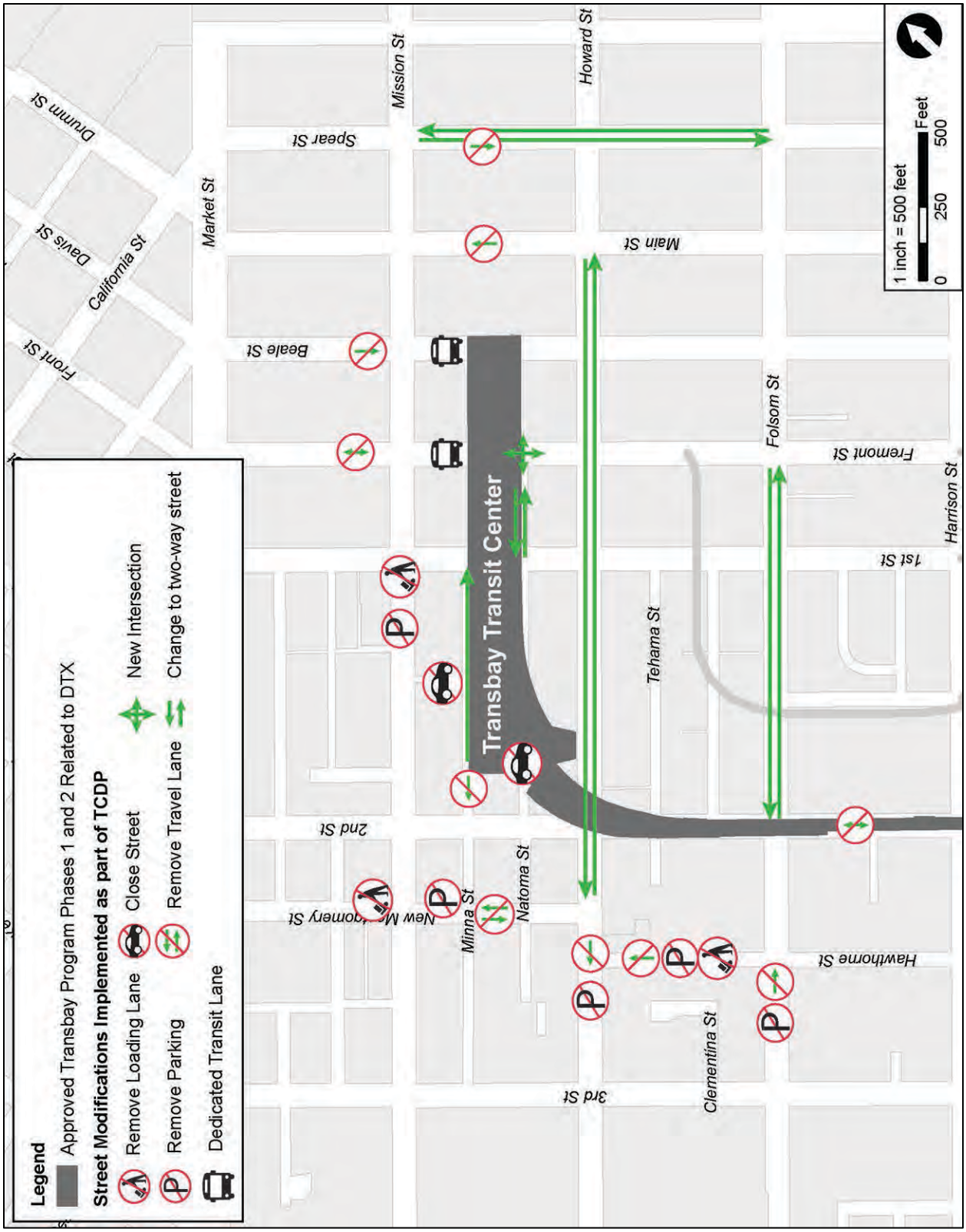
Greyhound Service and Other Private Operators

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.



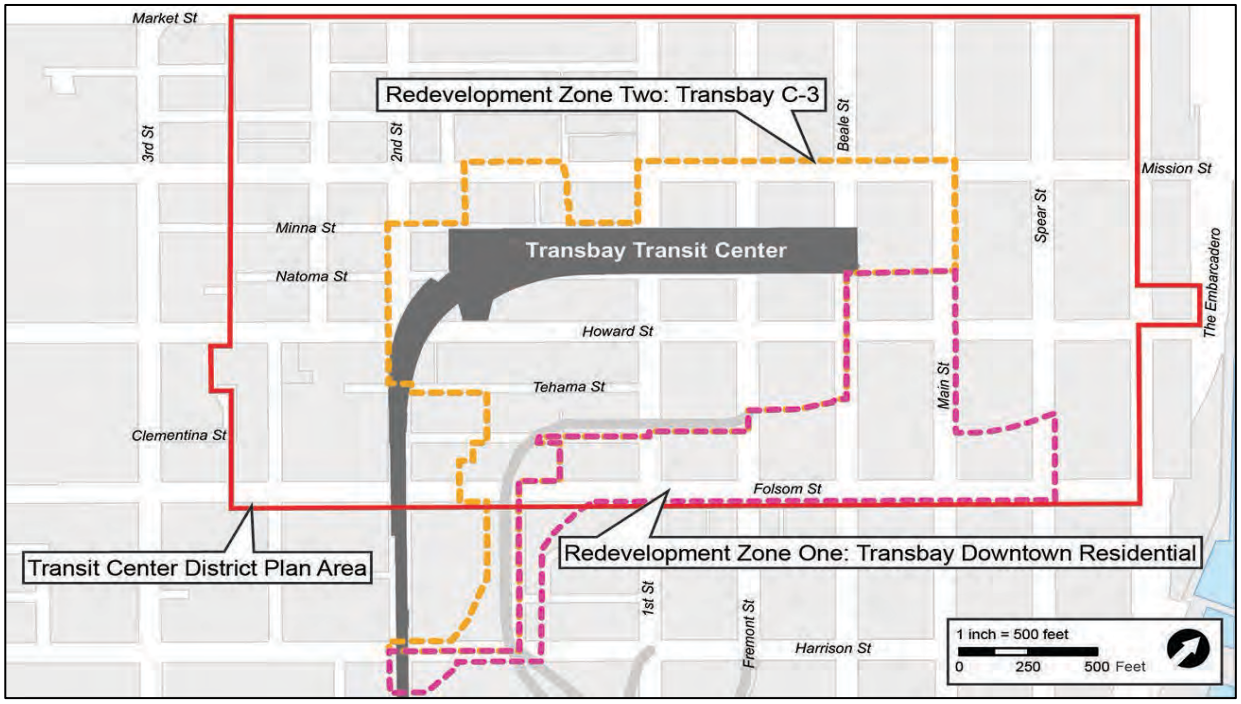
Source: AECOM adapted from City of San Francisco in 2012

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



Source: AECOM adapted from City of San Francisco in 2012

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

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 supporting local planning, the City has requested that the TJPA evaluate potential future land development on the proposed project sites that are not fully used for transportation facilities at a conceptual level in this SEIS/EIR since any such development could occur on property currently controlled by the TJPA; however, development would be a separate future action by TJPA and the City. Evaluation of potential future land development is included in the CEQA analysis to support local and regional land use planning. A specific development plan or private developer has not been identified at this time, and any proposed development project would be separately funded and may not include FTA federal funding. If the TJPA sells excess property that is not needed for the transportation improvements, any development approvals would be governed by the City's development review and permitting processes, and the City would be the lead agency for the CEQA review. Because no federal action is involved, any future development on these sites is evaluated as a secondary or indirect effect under NEPA ~~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 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.

The~~se~~ proposed project components are summarized in Table 2-3 and shown in Figure 2-6. Many of these components ~~Some of the proposed project components~~ were previously analyzed in the 2004 FEIS/EIR and addenda (described in Section 2.1.2, Approved Modifications to the Transbay Program); however, modifications to their ~~specific~~ locations, design, and construction warrant ~~and features of the vent shafts/emergency exits, for example, have been defined and updated since that time and can now be evaluated~~ evaluation in this SEIS/EIR. These components include the throat structure, the underground Fourth and Townsend Station, the vent structures/emergency exits, and the BART/Muni Metro underground pedestrian connector. The other components are new proposals and have not been previously evaluated.

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.

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.

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 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.

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

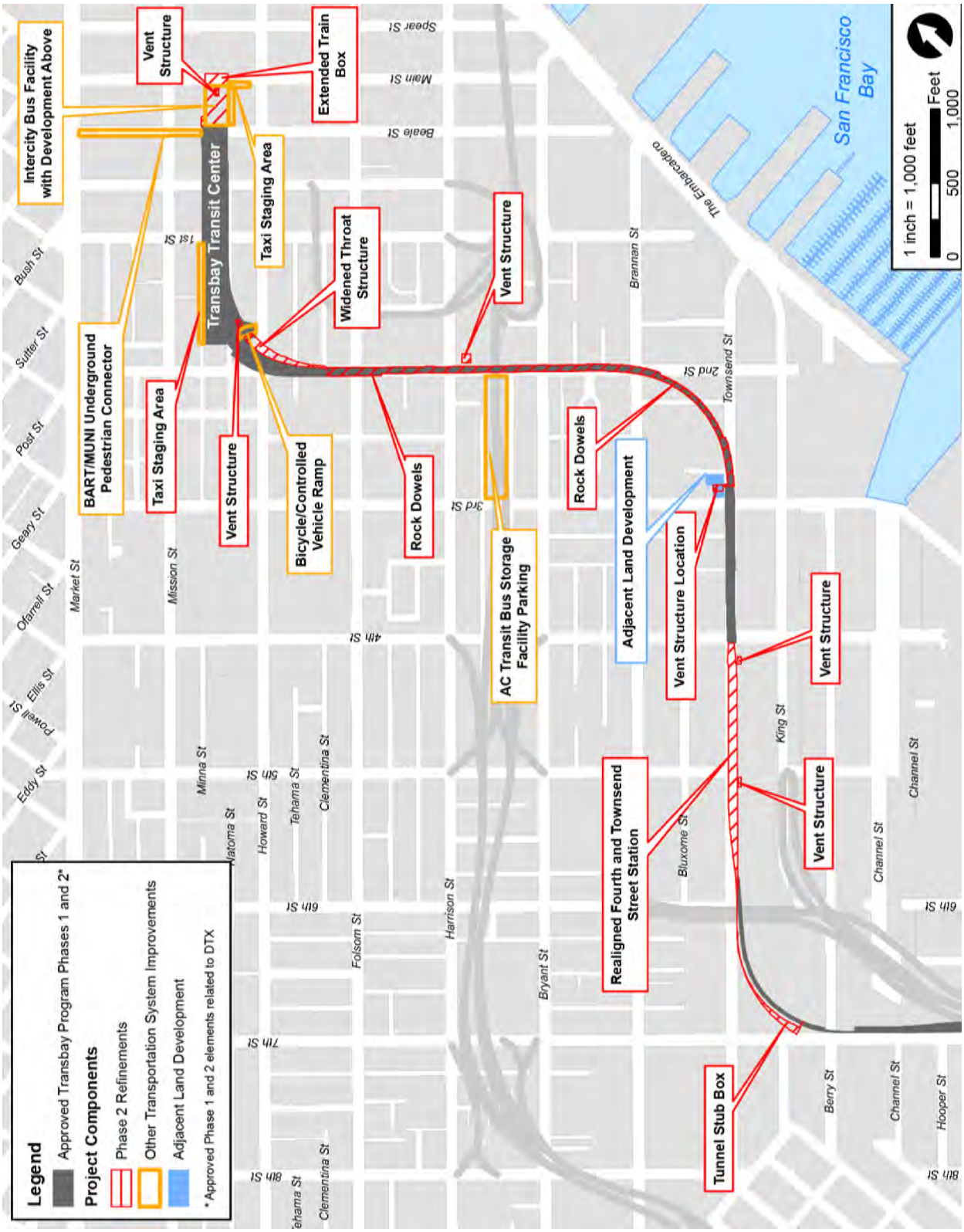
Year	Environmental Review	Approved 2004 Transbay Program	Refinements to the Transit Center Component of the 2004 Transbay Program	Refinements to the DTX Component of the 2004 Transbay Program
2004	Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project FEIS/EIR	• New Transit Center at First 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

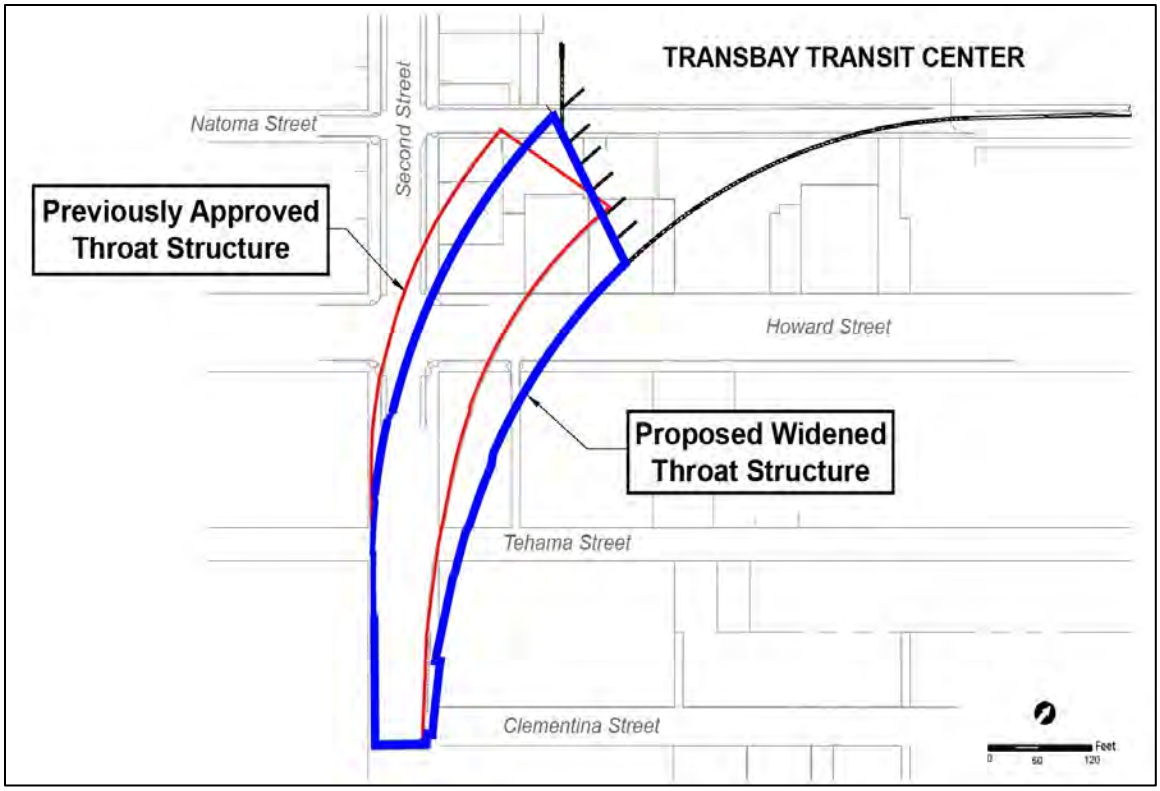
Table 2-3
Proposed Project Components

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 exhausts 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



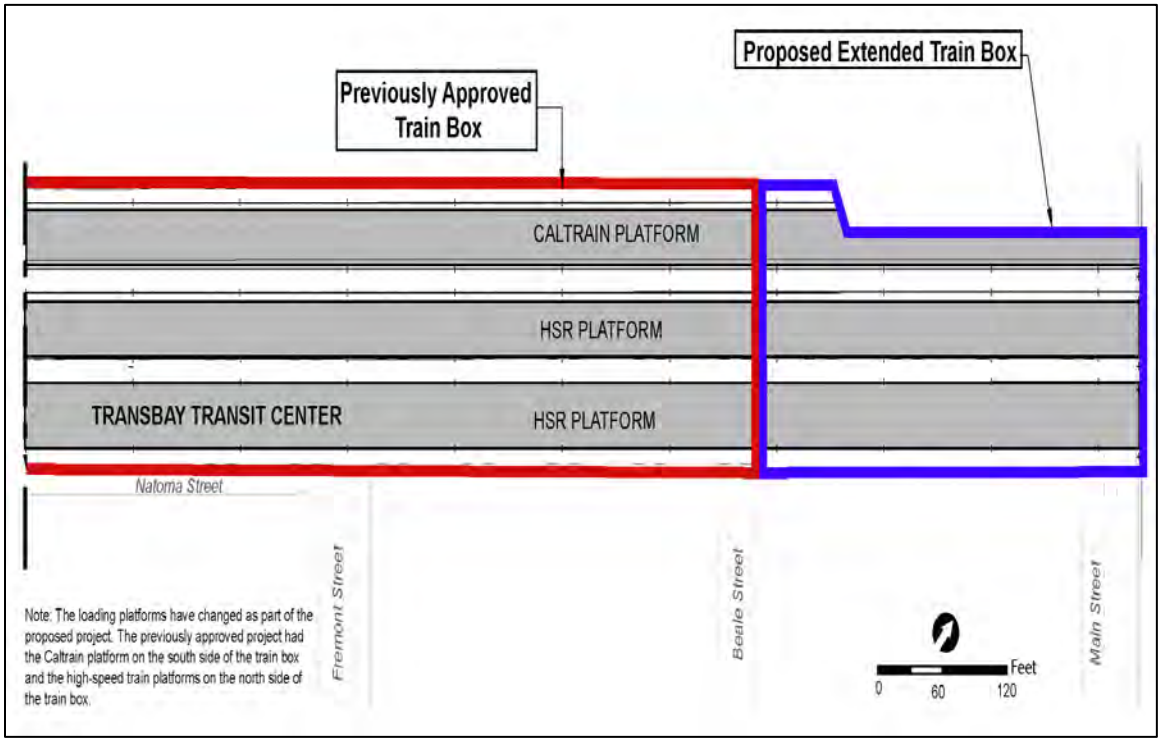
Sources: City and County of San Francisco 2013; compiled by AECOM in 2015

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



Source: TJPA 2013b

Figure 2-7 Previously Approved and Proposed Widened Throat Structure



Source: TJPA 2012a

Figure 2-8 Previously Approved and Proposed Train Box

Realigned Fourth and Townsend Street Station

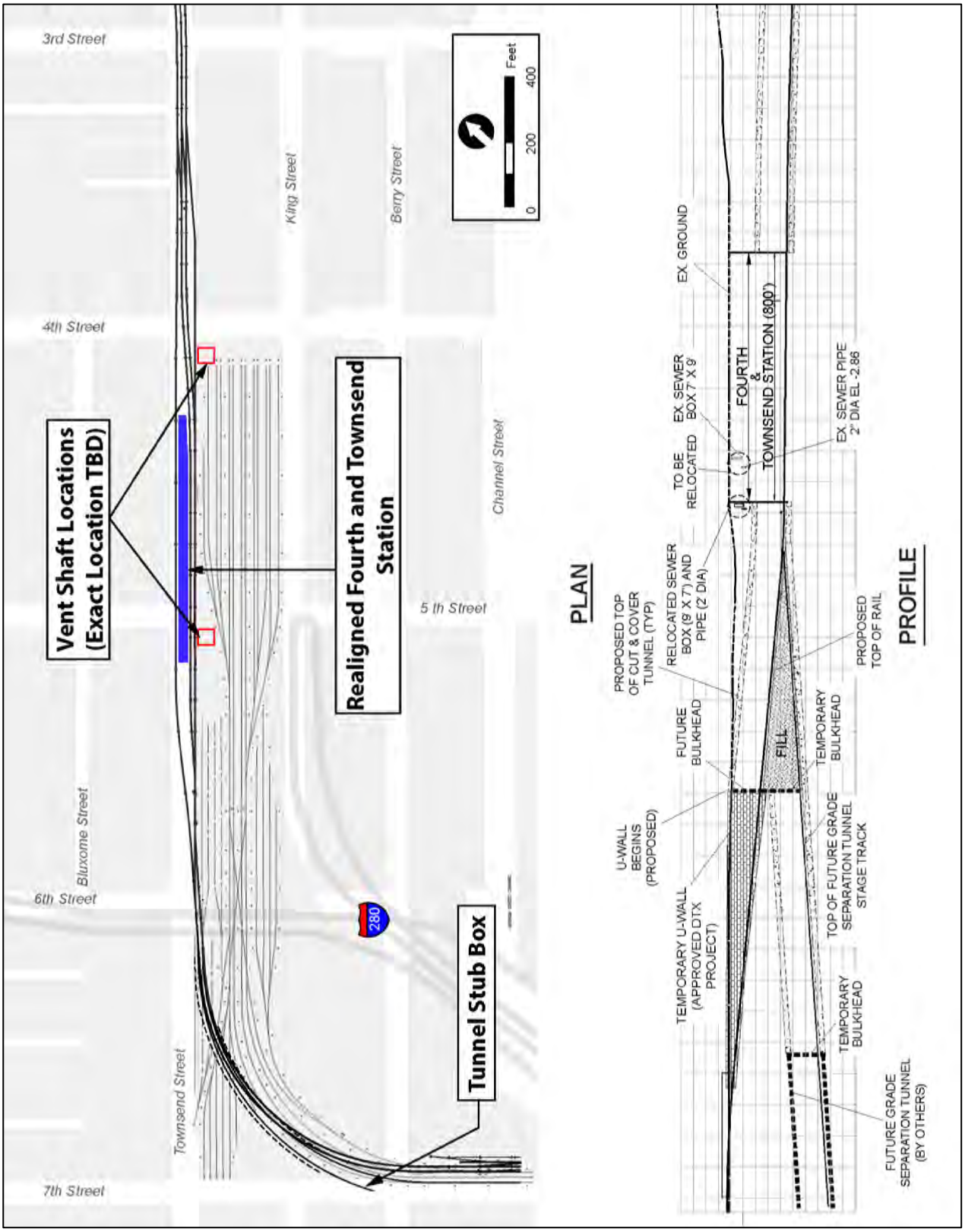
For the proposed project, the underground station at Fourth and Townsend Streets would be lowered and realigned along and underneath Townsend Street, a mezzanine added, and the tunnel lengthened. The realignment would shift the station slightly north from the previously approved DTX station plan and 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. The underground Fourth and Townsend Station would be constructed underneath the Muni Metro T-Line that will operate along Fourth Street. It is expected that coordination with SFMTA and a Memorandum of Understanding among TJPA, SFMTA, and possibly other City agencies will be necessary to identify the phasing, sequencing, and timing for construction that work for both agencies, and minimize both delays to construction of the underground station and disruption to T-Line operations.

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 and then renamed as the Rail Alignment and Benefits Study (RAB 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~~has been completed and the Phase II alternatives development draft report was released in May 2018.~~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~~. Nevertheless, based on ongoing communications between the City and the TJPA, according to the City, the recommendations from the RAB study would not be expected to affect the construction schedules of the rail station at the Transit Center or the DTX, and have reaffirmed the DTX alignment previously approved and modified as part of the proposed project.

Vent Structures

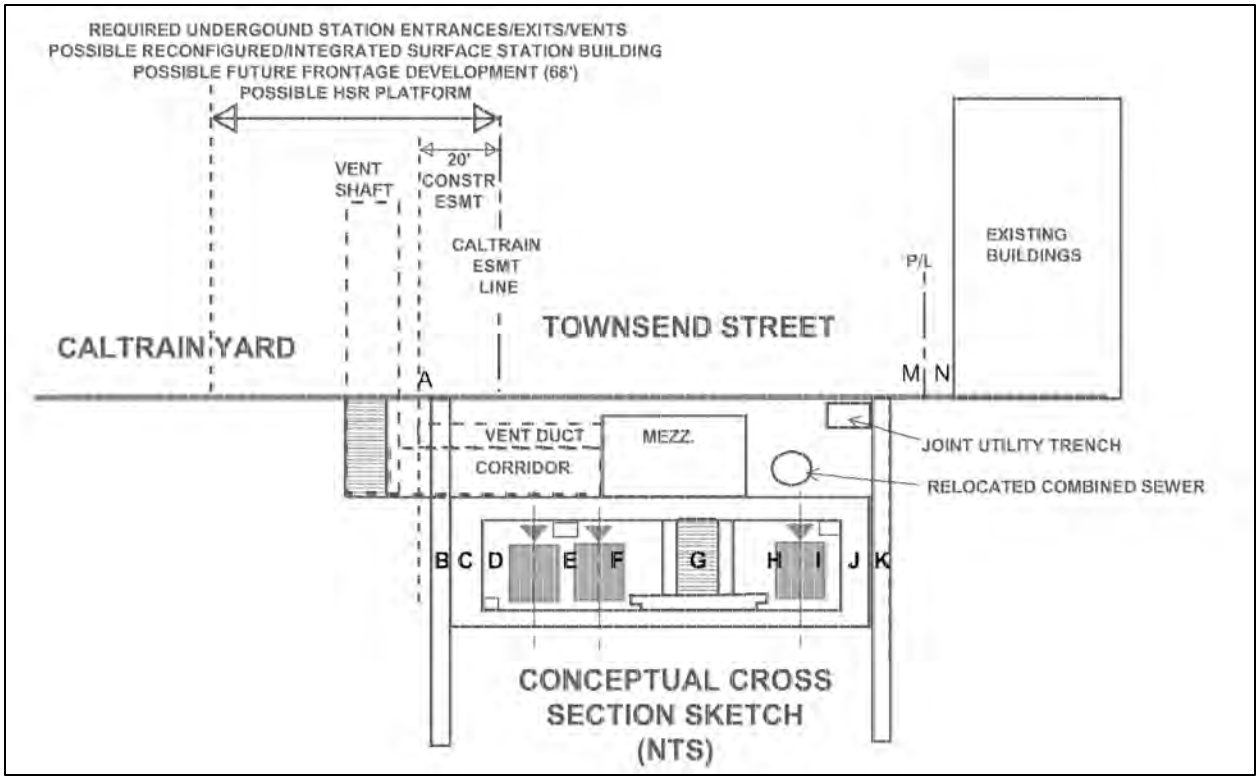
Construction of the DTX would require installation of emergency ventilation/smoke evacuation structures co-located with emergency tunnel exits when possible (collectively referred to as vent structures). As described in the introduction to Section 2.2.1, the 2004 FEIS/EIR evaluated potential impacts 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.



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

- Third and Townsend Streets – as originally proposed, this vent structure would either be sited in the northeast quadrant of a 13,750-square-foot parcel at 701 Third Street~~; an alternate location~~ or at an alternate location across Townsend Street at 699 Third Street and 180 Townsend Street ~~is also under consideration~~. Both sites have been analyzed. The original proposed vent structure site at 701 Third Street was occupied by a fast-food restaurant and surrounded by office, residential, and retail uses. This site is being redeveloped after the restaurant's lease expired in early 2017, however, and is no longer available. As a result, the TJPA has identified as its preferred location, the site at the northeast corner of Third and Townsend Streets (699 Third Street and 180 Townsend Street), which is occupied and surrounded by retail and office uses. 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.

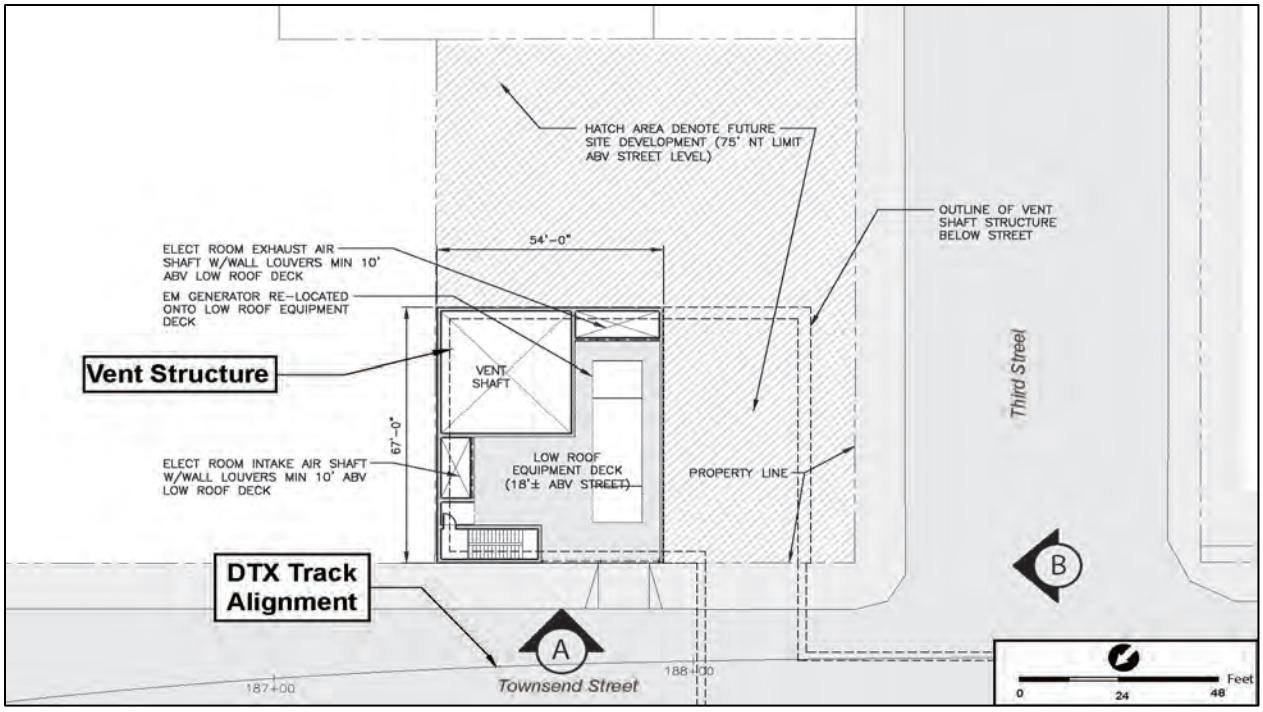
  A fourth vent structure would be constructed at the east end of the Transit Center in the vicinity of Natoma and Main Streets. This facility, including the emergency exits, would be integrated into the design of the proposed intercity bus facility (see below under "Other Transportation Improvements" 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 in accordance with context sensitive design guidelines and 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:

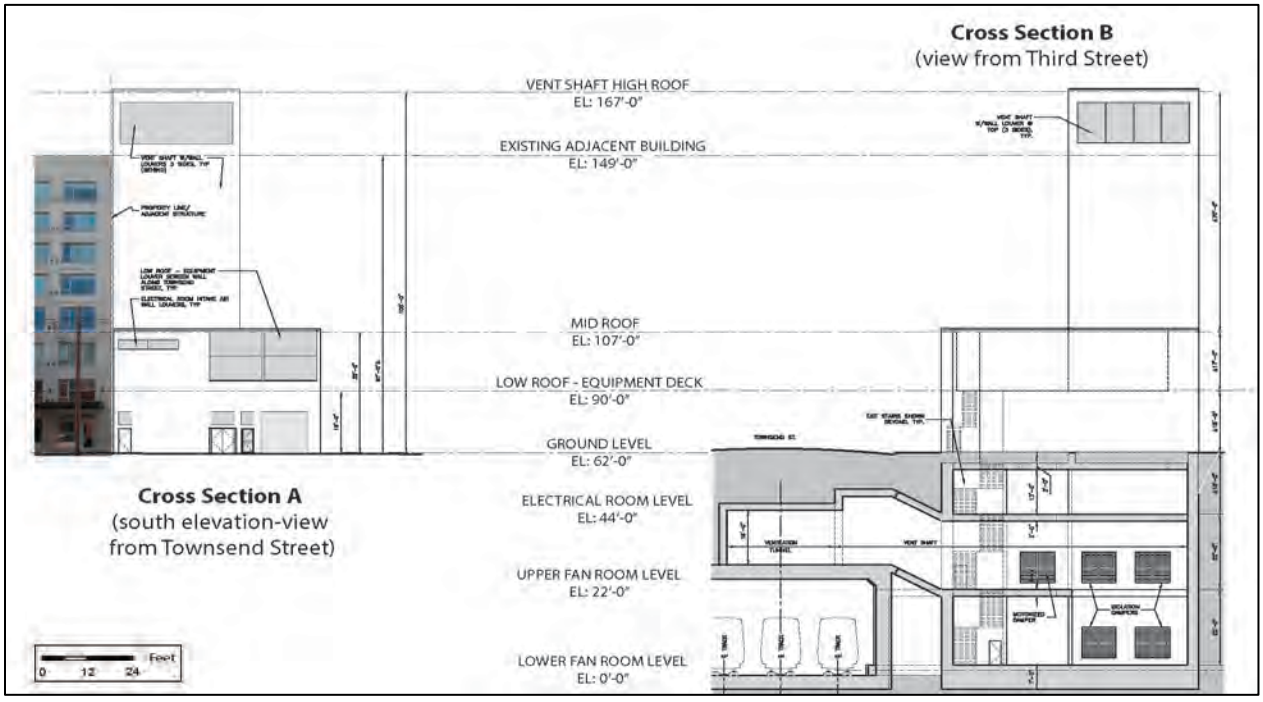
- Sufficient exit capacity must be provided to permit the evacuation of station occupants from platforms in 4 minutes or less.
- Evacuation also must be provided from the most remote point on a platform to a point of safety in 6 minutes or less.
- A maximum of 2,500-foot spacing between emergency or 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.

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.



Source: Parsons Transportation Group 2014b

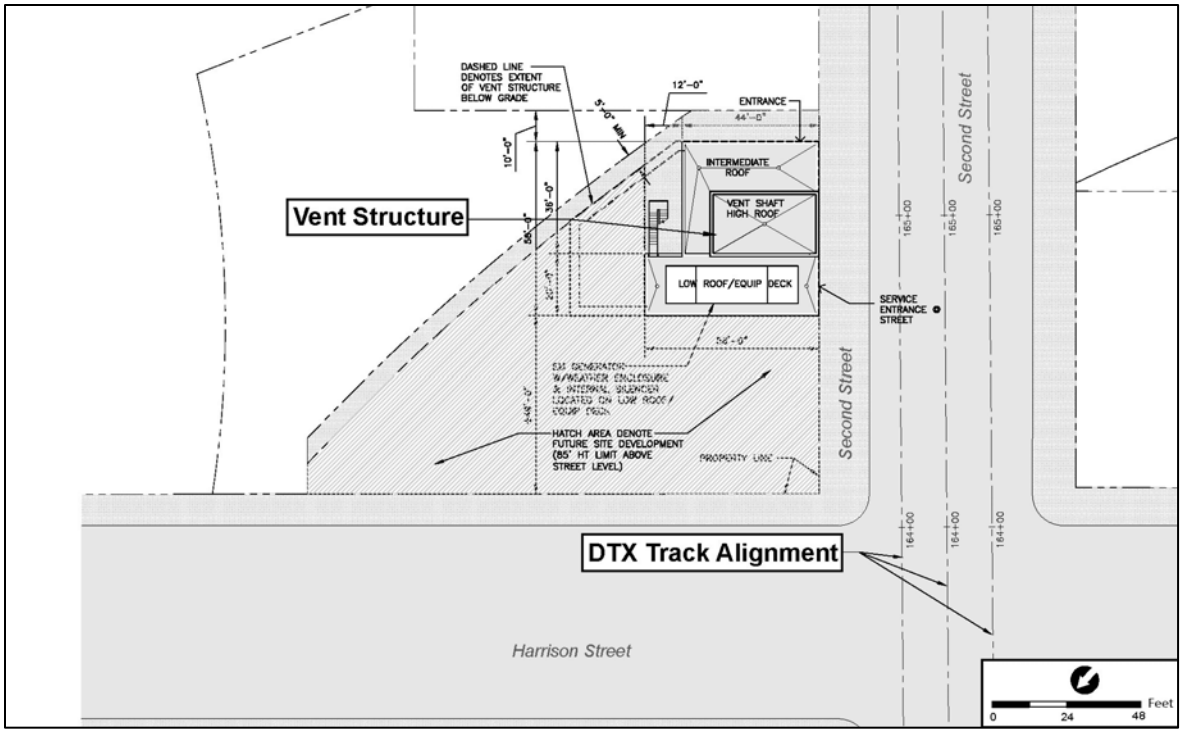
Figure 2-10a Vent Structure at 701 Third Street – Plan View*



Source: Parsons Transportation Group 2014b

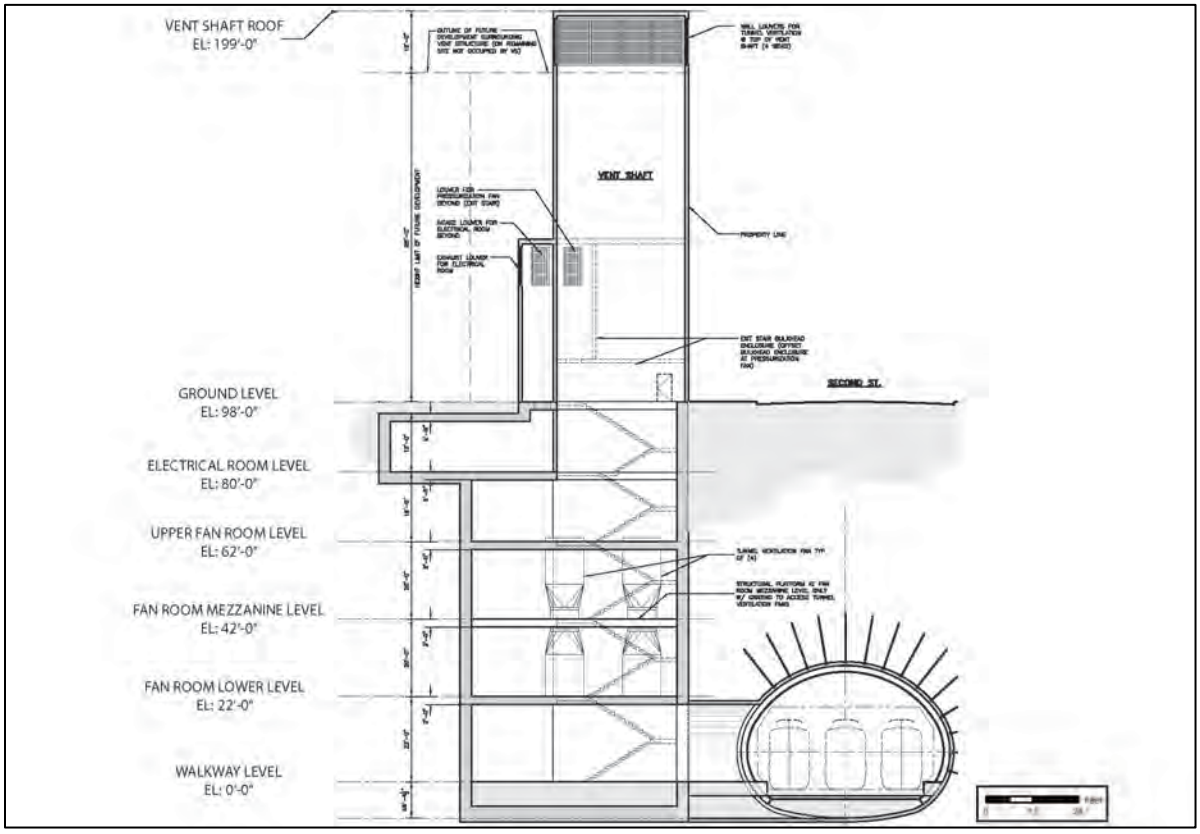
Figure 2-10b Vent Structure at 701 Third Street – Cross Section*

* The preferred site is across the street from the plans shown in this figure. Nevertheless, the features and components on the plans are relevant for the vent structure at 699 Third Street and 180 Townsend Street.



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

Tunnel Stub Box

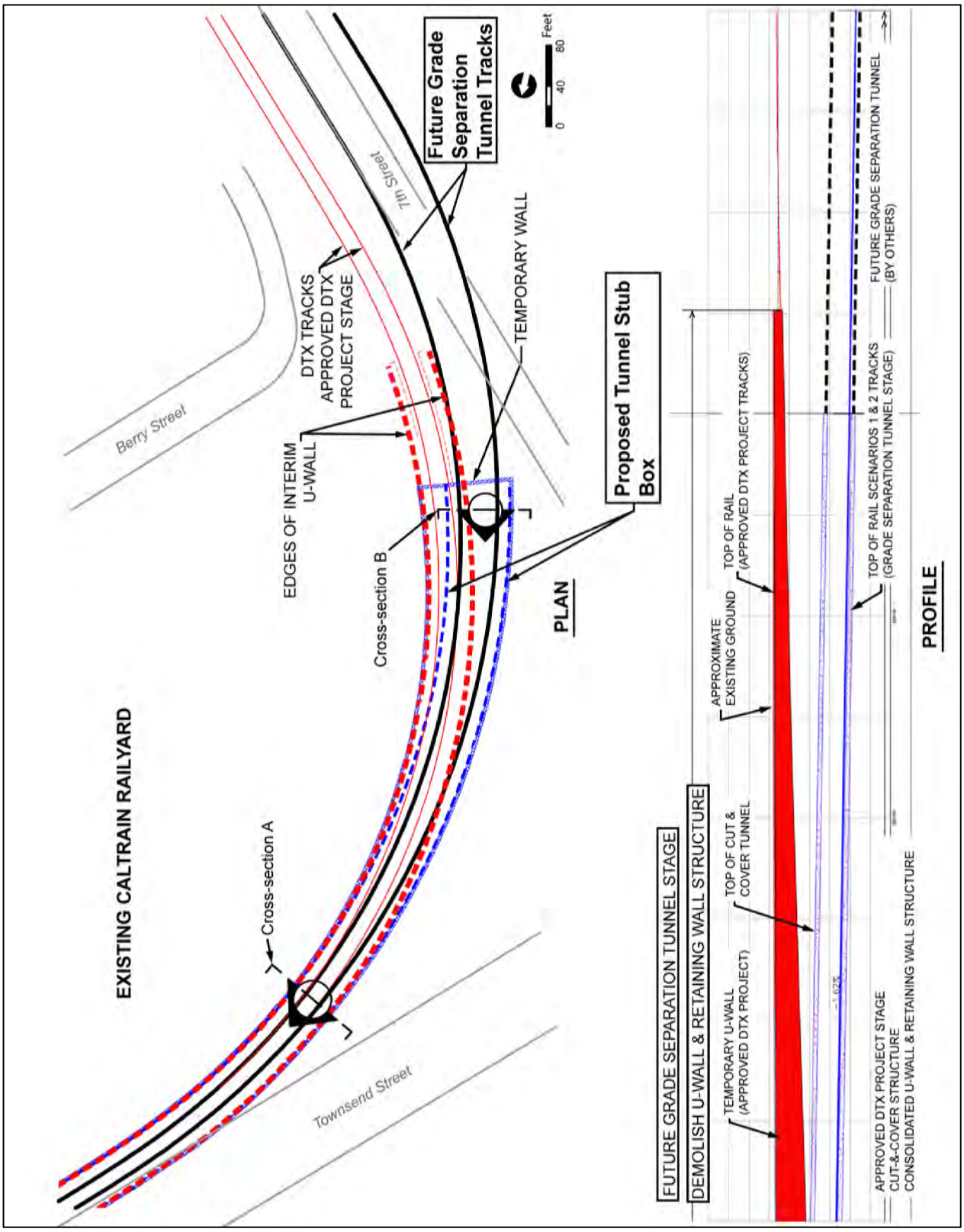
The proposed project would involve modifications at the west end of the railyard located south of Townsend Street between Sixth and Seventh Streets (Figure 2-6 and Figures 2-12a and 2-12b). The refinements would construct a below-grade train box segment at the west end of the railyard beneath the already 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

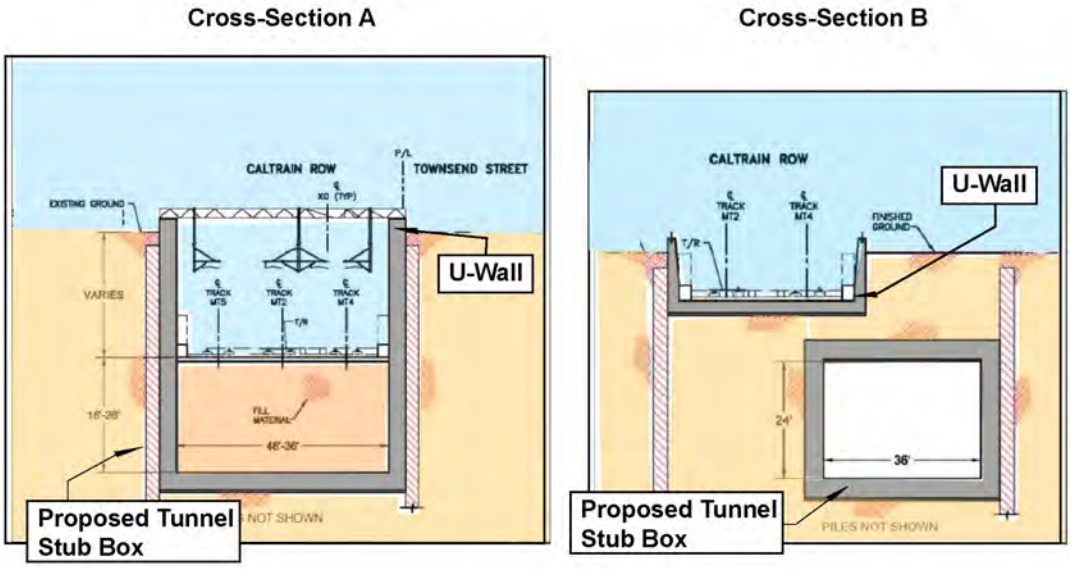
Construction of the mined tunnel from the Townsend Street curvature and along Second Street would require installation of rock dowels to temporarily support the tunnel (see Figure 2-13). Rock dowels are high-strength steel reinforcing bars installed into holes drilled around tunnel perimeters and grouted 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.



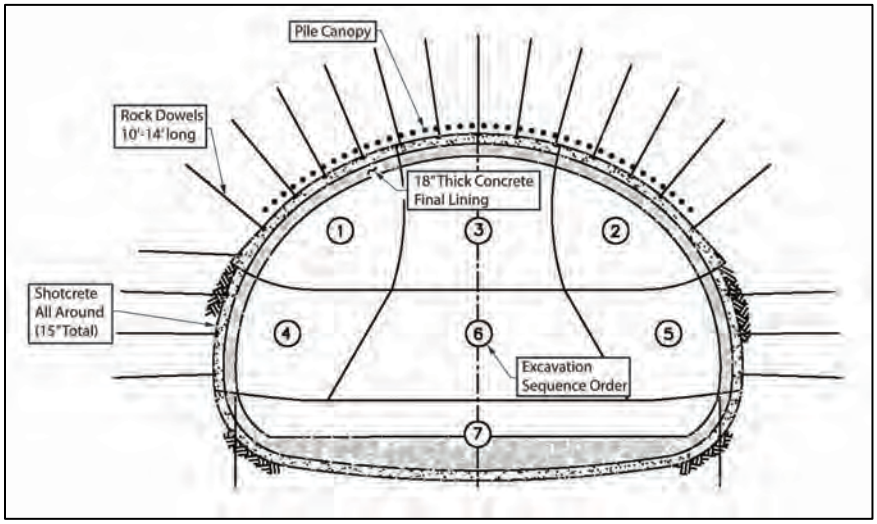
Source: TJPA 2013c

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

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

Figure 2-14 Additional Trackwork South of the Railyard

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 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 turnback track would cross 16th Street at grade, but it would not cross Mission Bay Drive to the north or Mariposa Street to the south.

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. The MOW track would not cross any through streets.

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 necessary to the overhead catenary system of the ETB and Caltrain at the 16th Street crossing.

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. Caltrain, in consultation with the TJPA and the California High-Speed Rail Authority, has determined that Caltrain trains can be stored at the Transit Center, and the proposed turnback track would be used for 24 crossings per day. This information takes into account a typical Caltrain schedule and includes the maximum number of trips per day using the turnback track in order to present a conservative analysis of the potential impacts. Caltrain has committed not to use the turnback track during the AM and PM peak hours (7:30 a.m. to 8:30 a.m. and 4:30 p.m. to 5:30 p.m.) because Caltrain's proposed schedule at the Transit Center does not require the use of the turnback track during this peak period and because it would avoid impacts to peak period traffic. Changes to the schedule in the future would be assessed by Caltrain and TJPA. Table 2-3a identifies the number of trains crossing the turnback track. ~~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, but use of the turnback track would occur only during off-peak hours. 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). The additional gate "downtime" associated with turnback track use is presented in Table 2-3b and totals approximately 28 minutes over an entire day, none of which would occur during the AM and PM peak hours.

Table 2-3a
Caltrain Service Levels to Transit Center – Trains Required and Use of the Turnback Track

At 6 Caltrain Trains/Peak Hr/ Direction to Transit Center	With Caltrain Storage at the Transit Center**	
Time Period	**Trains Required**	**All Day One-Way Trips (across 16th Street)**
4:02-6:34 am	4	8
9:13-10:39 am	2	4
3:08-4:34 pm	2	4
7:13-8:39 pm	4	8
11:00 pm -12:00 am	0	0
Total	**12**	**24**

Notes:
* HSR dwell times are estimated to be 40 minutes and define Caltrain scheduled arrival and departure times at the Transit Center.
** Assumes three Caltrain consists stored overnight and two Caltrain consists stored midday at the Transit Center; the Draft SEIS/EIR assumed no trains stored at the Transit Center.
Source: Caltrain, April 2016.

Table 2-3b
Change in Gate Downtime by Time Period with the Proposed Project Turnback Track

Time Period	Crossings	Total Delay (min:sec)
4:00 am to 6:35 am	8	9:20
9:15 am to 10:40 am	4	4:40
3:10 pm to 4:35 pm	4	4:40
7:15 pm to 8:40 pm	8	9:20
Total	**24**	**28:00**

Source: Caltrain, AECOM, 2016.

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.

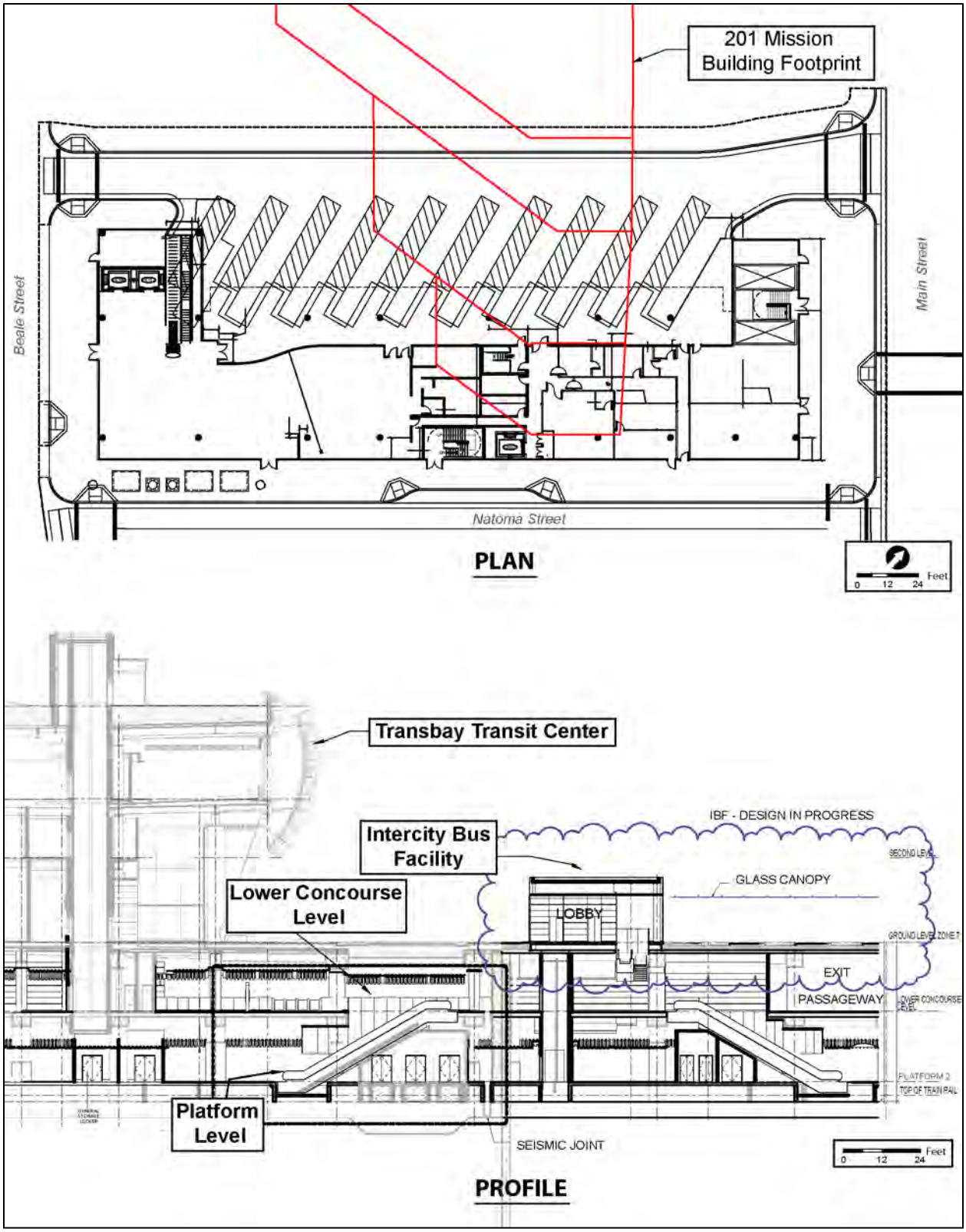
Other Transportation System Improvements

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

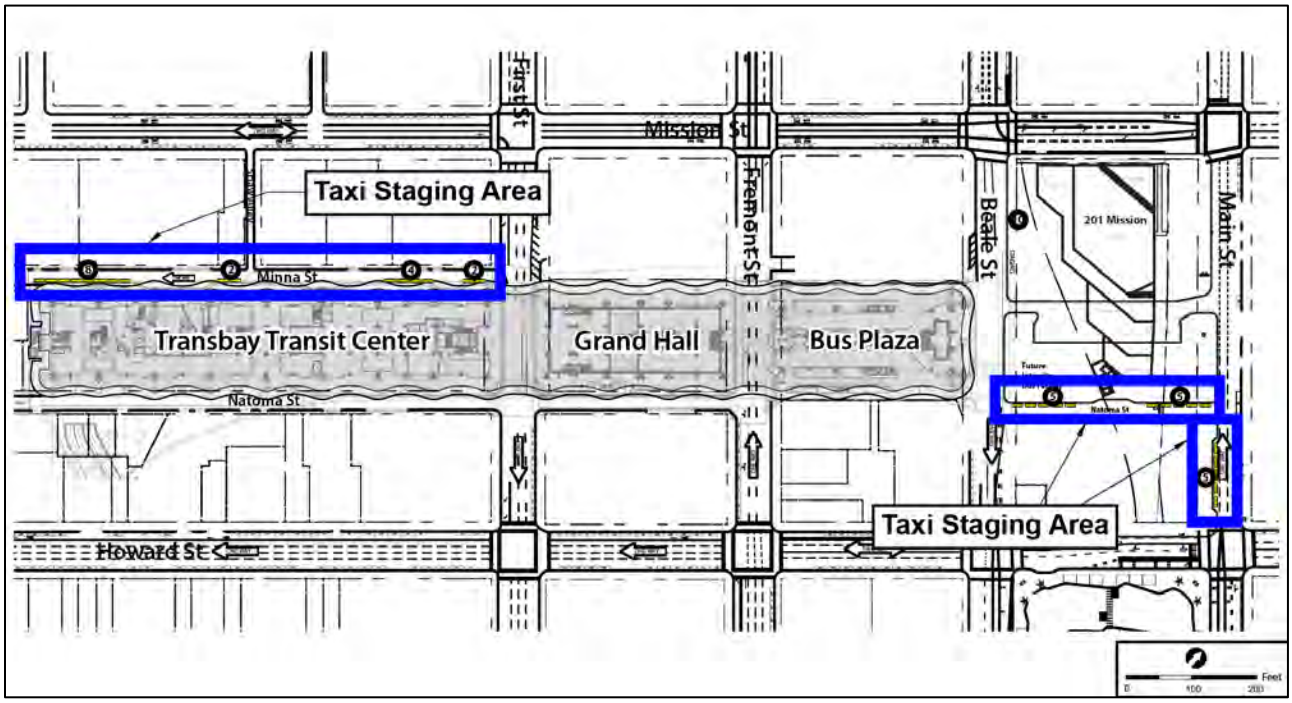
Figure 2-15 Intercity Bus Facility Levels 1 and 2 – Plan and Profile

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.

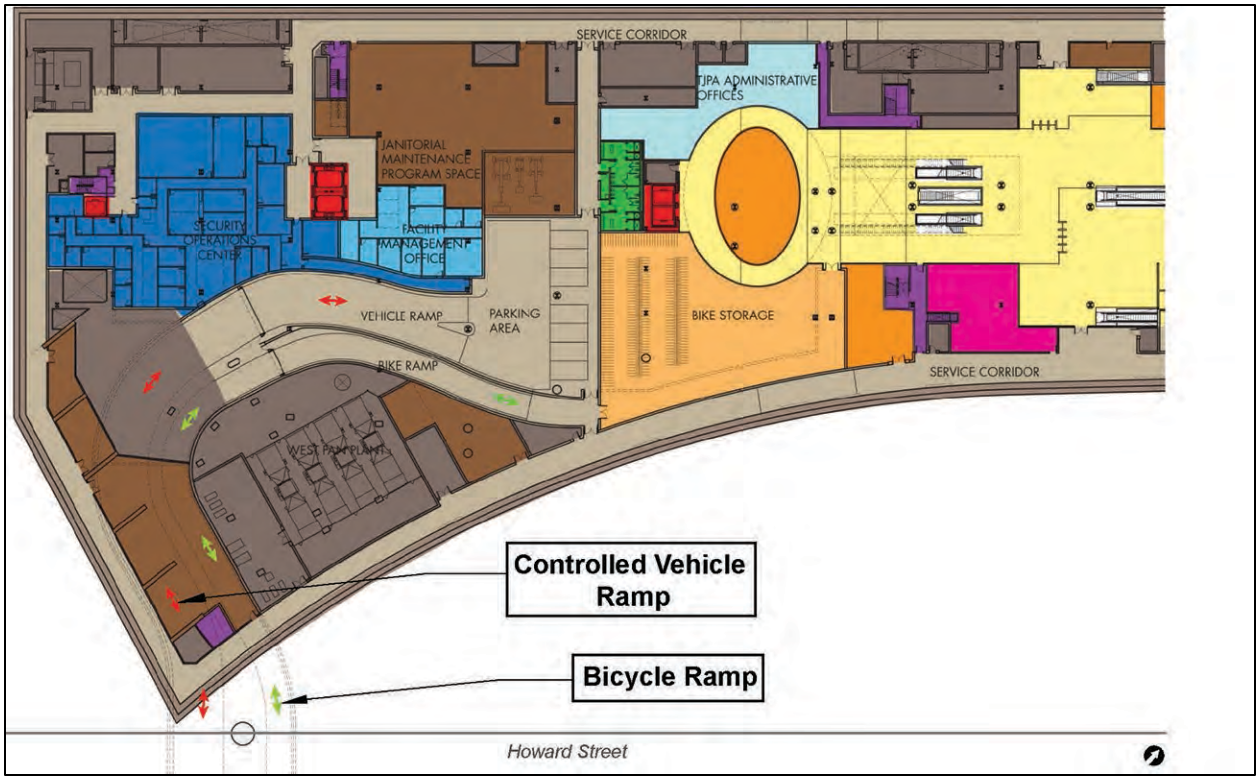


Source: TJPA 2014

Figure 2-16 Taxi Staging Areas

Bicycle/Controlled Vehicle Ramp and Below-Grade Bicycle Facilities

The proposed project calls for use of ramps to the Lower Concourse level by bicycles and service vehicles. The 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, for service and maintenance vehicles, 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).



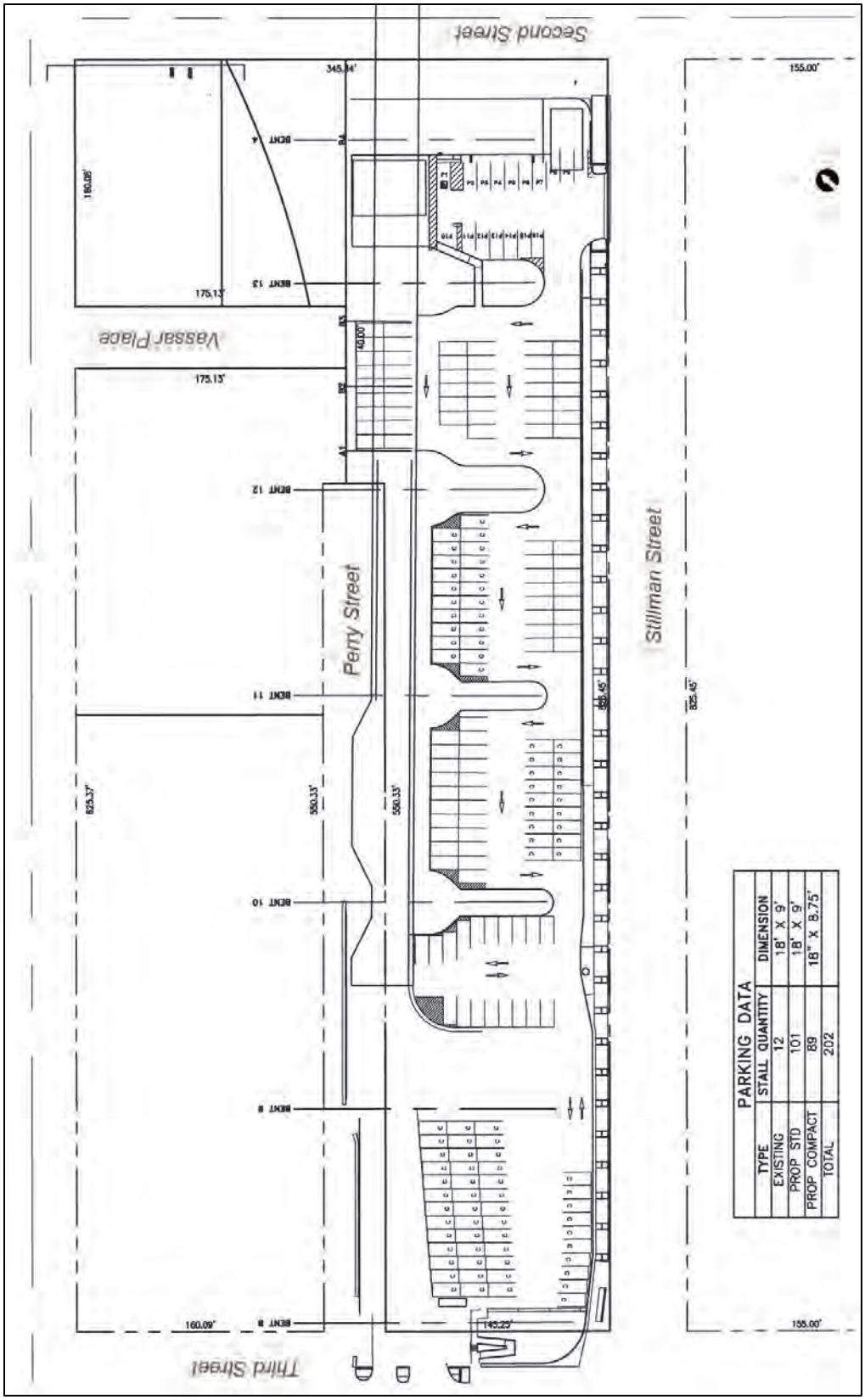
Source: TJPA 2013a

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

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.



Source: TJPA 2012b

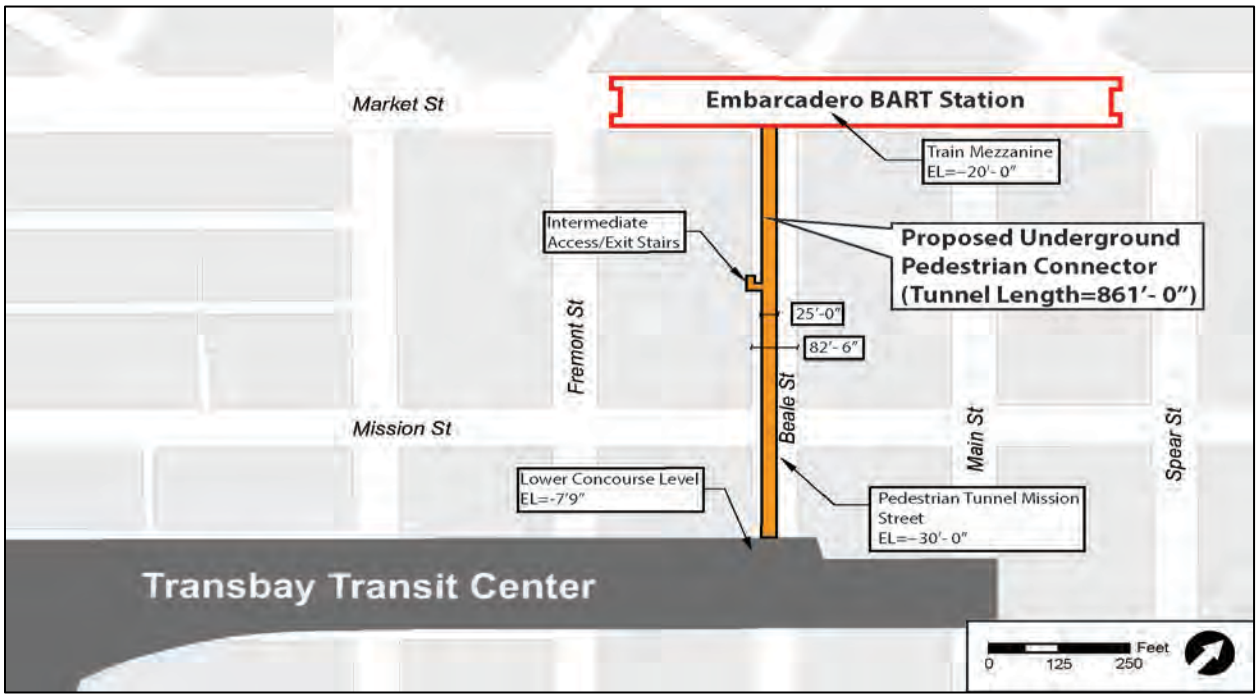
Figure 2-18 AC Transit Bus Storage Facility – Nighttime and Event Valet Parking

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.

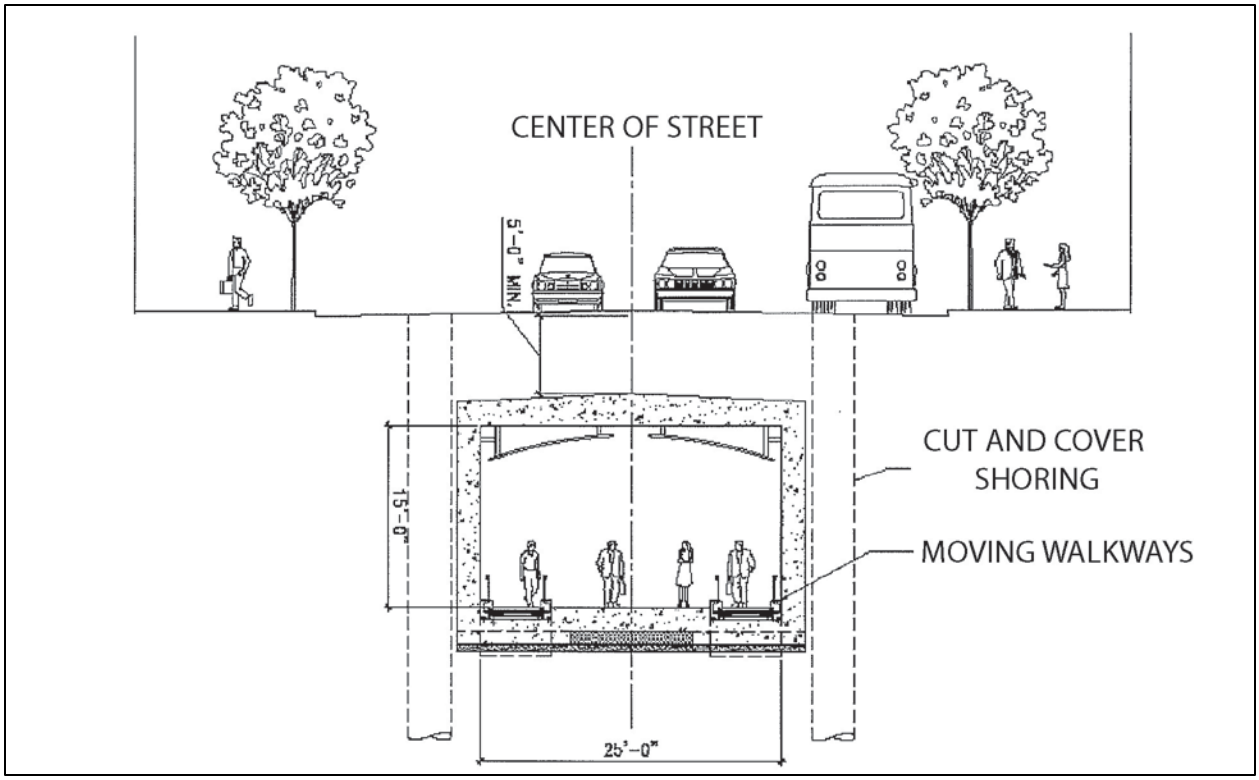
The proposed project would include an underground pedestrian tunnel following Beale Street to provide direct connection between the Embarcadero BART/Muni Metro Station and the Transit Center, as shown in Figure 2-6. Figures 2-19a and 2-19b show the plan and cross-section views of this proposed project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

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.



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

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 vent ~~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 proposed to be modified pursuant to the Central SoMa Plan that is currently pending approval. The site zoning would change from Service Light Industrial to Mixed Use Office, designed to encourage a mix of residential and non-residential uses, including retail, nighttime entertainment, tourist hotels, ~~facilitate the expansion of existing general commercial, manufacturing, home and business service, live/work use,~~ arts uses, light industrial activities, and ~~small design professional~~ offices ~~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 constructed ~~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 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.

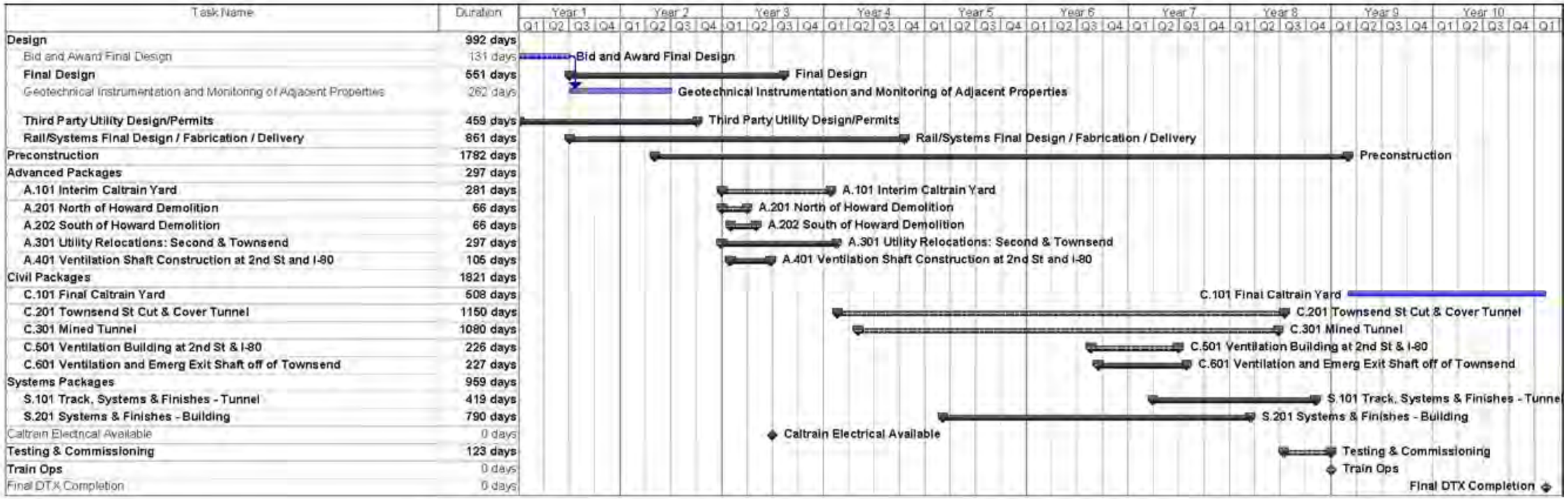


Figure 2-20 Transbay Program DTX Schedule

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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	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. At this time, construction of the pedestrian connector is expected to take approximately 18 months.
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.

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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

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 underpinned while construction occurs below, and some employees may be relocated, if necessary, either within the building or off-site~~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 constructed ~~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.[1]

[1] 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.

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~~ originally proposed vent structure site at 701 Third Street was~~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, which is now TJPA's preferred site, 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.

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. This method does not use a specific technique for excavation or support. Rather, the tunnel is divided into segments, which are then mined using an excavator and cutting equipment. As the soil is removed from each segment, pressurized concrete is sprayed on the tunnel ceiling, sides, and floor. If additional support, beyond the concrete is needed, lattice girders can be installed. These steps are then followed in the next segment.

The basic principle of NATM/SEM design is to remove soil incrementally which allows controlled ground movements to ~~mobilize~~ use the strength of the ground to support the excavation. These gradual, incremental 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).

Potential Other Construction Methods for Selected Segments of the Alignment

After the release of the Draft SEIS/EIR, the TJPA initiated a Tunnel Options Study, intended primarily to explore construction methods that could further reduce the intensity and duration of construction impacts. The methods that were recommended for further evaluation affect selected segments of the alignment (see Figure 2-21; the segments shown in orange and in magenta are those where other construction methods are possible and evaluated in this Final SEIS/EIR). The Tunnel Options Study concluded that portions of the cut-and-cover segments along Second Street and Howard Streets at the widened throat structure and along Townsend Street (between the realigned Fourth and Townsend Station and Clarence Place) could also be constructed using mining techniques.

As indicated in Figure 2-21, there are several potential construction methods under consideration for certain segments along the alignment, in addition to the proposed cut-and-cover and SEM techniques. Most of the alignment would be constructed using the cut-and-cover construction method, as reflected in Figure 2-2. This method is commonly used when the tunnel depth is relatively shallow and the excavation from the ground surface is possible, economical, and acceptable. Cut-and-cover construction would involve cutting an opening from the ground surface, constructing the underground infrastructure for DTX, and then covering the opening. The tunneled segment identified in Figure 2-2 would be constructed using the SEM tunneling method along Townsend Street (starting at Clarence Place and extending east) and then turning north along Second Street (stopping at Clementina Street).

A disadvantage of the cut-and-cover construction method is the disruption that occurs at the street level during construction – this disruption, as reported in the 2004 Final EIS/EIR, includes vehicular, pedestrian, and bicycle circulation impacts; interference with access to residences and businesses; air emissions; noise and vibration; dewatering and increased sediment loads to storm sewers, and potential geotechnical risks. The extensive amount of construction in the project vicinity, which includes infrastructure projects using the cut-and-cover construction method, has intensified public concerns about the surface disruption and socioeconomic implications of this construction technique. The TJPA is proposing to install traffic decking, where feasible, which would significantly reduce the construction impacts by covering the excavation and allowing surface traffic to resume and access to adjacent properties to be restored. The TJPA successfully installed decking over long weekends for traffic use over the transit center excavation. Despite the traffic decking and the mitigation measures that were adopted as part of the Transbay Program and incorporated as part of the currently proposed project, a number of comments received on the Draft SEIS/EIR expressed the need to examine construction methods that could be less impactful.

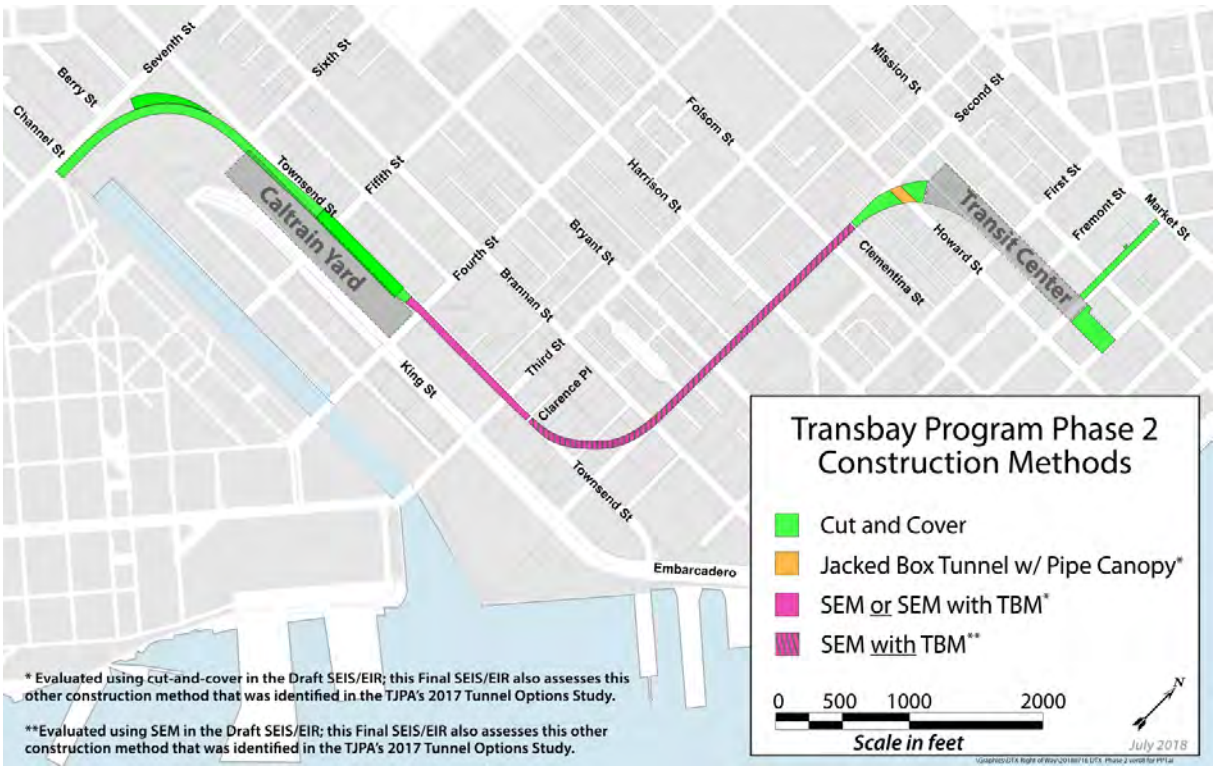

Figure 2-21 Construction Methods Under Consideration by Location

In response to these comments, the TJPA initiated a Tunnel Options Study to explore the possibility of reducing segments planned for cut-and-cover construction and constructing those segments instead by different mining methods. The resulting Tunnel Options Study Report was issued on November 7, 2017, and subsequent addenda were completed by March 2018. It was found that none of the options were reasonable or feasible for the full length of the alignment through an evaluation of 11 risk assessment criteria: constructability, ground conditions, groundwater, disruption to/relocation of utilities, community impact, environmental impacts, safety, procurement/market forces, design, 3rd party coordination, and permit/right of way considerations. A summary of the risk assessment is located in Section 6.3 of the Tunnel Options Study Report and the full risk assessment analysis is located in Appendix F of the Tunnel Options Study Report. Although none of the options were reasonable or feasible for the full length of the alignment, the report identified some initial possibilities of other construction methods that could be used on segments of the tunnel based on a consideration of the aforementioned risk assessment criteria and impacts to schedule and cost. These possible construction methods, recommended for further evaluation in the report, are included in this Final SEIS/EIR and are described below by segment. All of these methods would reduce the intensity and/or duration of the construction impacts in the identified locations. The selection of the preferred construction method will depend on further evaluation using the aforementioned risk assessment criteria and consideration of the tradeoffs in cost and schedule after completion of the next phase of design, 30 percent Preliminary Engineering, for the proposed project. Other construction methods that were considered but rejected in the Tunnel Options Study are described later in Section 2.4, along with the reasons for their rejection.

Mined Tunneling at the Howard Street Crossing (at the widened throat structure). This construction method identified for the Howard Street crossing is the "jacked box pilot tunnel with a pipe canopy." This construction method provides the benefit of avoiding disruption at the Howard Street crossing while controlling costs by limiting the mined excavation to this relatively short section of the widened throat structure (extending from the west side of the Second and Howard Street intersection approximately

230 feet eastward along Howard Street and 80 feet across Howard Street). Figure 2-22a illustrates the extent of this mining method in lieu of cut-and-cover construction.

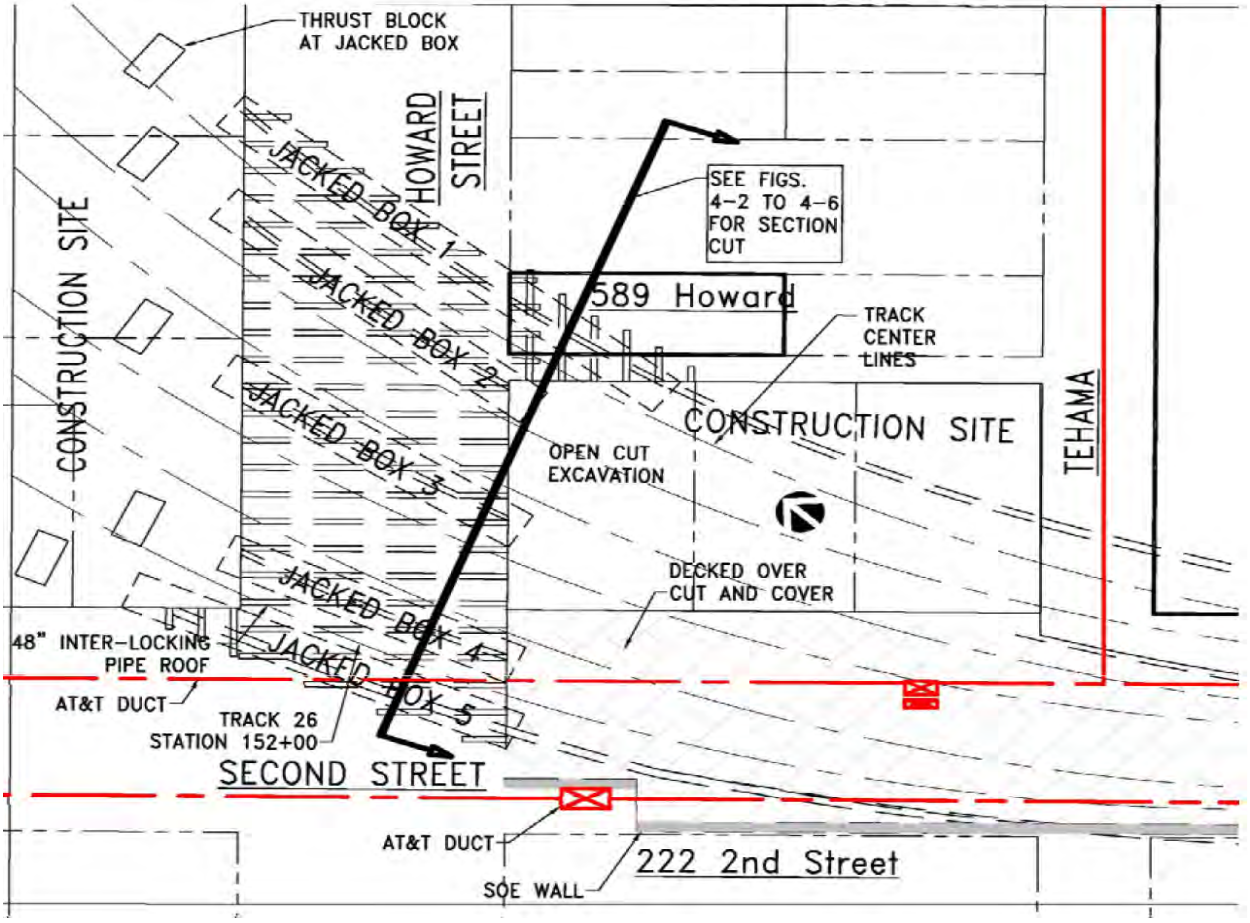

Figure 2-22a Jacked Box Pilot Tunnel with a Pipe Canopy – Plan View

The jacked box pilot tunnel with a pipe canopy method involves first pushing interlocked metal pipes horizontally from excavation pits at the construction sites on the north and south sides of Howard Street to form a roof for the excavation and to help reduce potential ground settlement. The rectangular concrete boxes (approximately 15 feet tall by 10 feet wide) would then be formed in the excavated pits and pushed horizontally below the pipe canopy roof using jacks to start the excavation of the tunnel. Figure 2-22a shows a potential for five such boxes to be pushed into place under the surface of Howard Street. Use of jacked boxes is a conventional mining method for installing culverts under roads or train crossings with limited soil cover above the tunnel (generally, soil cover that is less than the diameter of the tunnel) and is most cost effective for shorter tunnel lengths, typically under 150 feet in length. Once the boxes are in place, the soil inside the boxes would be excavated and removed from the excavated pits on the north and south of Howard Street.

After removal of the soil from the boxes, small drill rigs would proceed from the excavated pits into the small tunnels formed by the jacked boxes and drill micropiles below the boxes to form walls. Following installation of the micropiles, the boxes would be filled with concrete to form part of the roof of the tunnel. Excavators would then start mining from the north and south sides of Howard Street underneath the pipe canopy roof and jacked boxes, and between the walls. Shoring may be used as the top portion of

the tunnel is excavated to reduce settlement. Lastly, concrete arches would be installed between the boxes and walls to complete the final tunnel roof, and the exterior walls and bottom of the tunnel would be cast with concrete for the final structure. Figure 2-22b illustrates a cross section of the tunnel under Howard Street.

The jacked box pilot tunnel with a pipe canopy would cost approximately $208 million more than cut-and-cover construction (as inflated to the projected year of expenditure) and have negligible impacts to the project schedule, compared to the planned cut-and-cover approach.

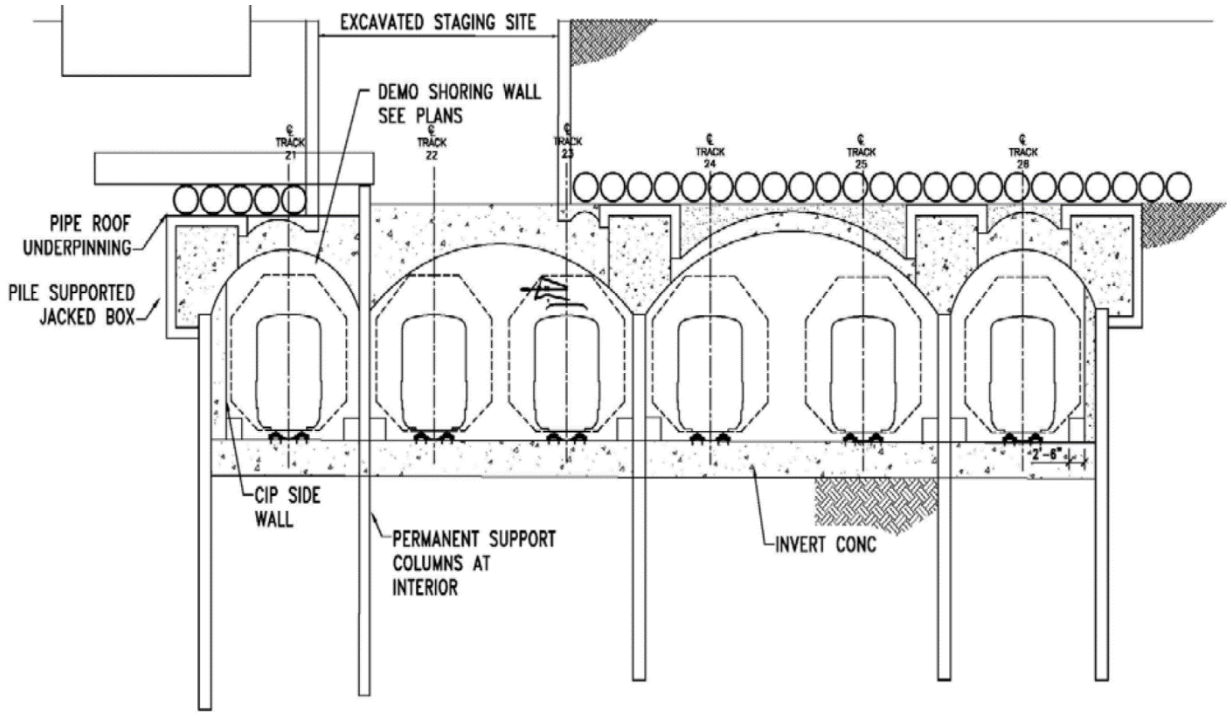

Figure 2-22b Jacked Box Pilot Tunnel with a Pipe Canopy – Cross Section

Extending SEM west of Clarence Place (along Townsend Street). SEM is already planned along Townsend Street east of Clarence Place. West of Clarence Place, cut-and-cover construction is proposed (see Figure 2-2). An alternative to cut-and-cover construction in this segment of the alignment would extend the SEM construction method about 1,200 feet, from Clarence Place westward through the Townsend/Fourth Street intersection. Similar to the SEM method proposed east of Clarence Place, the tunnel would be a single large cavern that would be sequentially excavated and supported. In comparison to cut-and-cover, compensation grouting would be required under the street and sidewalks to reduce settlement due to soft ground conditions along this segment. Compensation grouting involves the injection of a mortar-like grout under high pressure to compact and displace the adjacent soils. To inject the grout into the ground, access pits approximately 15 to 20 feet in diameter and 15 to 20 feet deep every 300 feet along Townsend Street would be established. In each access pit, there would be grout mixers, pumps, and power to operate the equipment and inject the grout. Excavation for the access pits would typically be in parking spaces to avoid interfering with local traffic and can be decked over when not in use.

The extension of SEM tunneling along Townsend Street would cost approximately $104 million more than cut-and-cover construction (as inflated to the projected year of expenditure) and extend the construction duration by approximately nine months, compared to the planned cut-and-cover approach.

Extending SEM west of Clarence Place (along Townsend Street) with Tunnel Boring Machines. This construction method is similar to the method described in the preceding discussion except that tunnel boring machines (TBMs) would also be used to help create the tunnel (see Figure 2-21). This method involves installing two parallel tunnels with TBMs that would be lined with concrete segments, and then SEM tunneling would occur between the TBM-created tunnels (see Figure 2-23). The TBMs would enter at the cut-and-cover station box excavation for the Fourth and Townsend Street Station, adjacent to and immediately west of this segment. Lining for the TBM tunnels would be delivered to the site by truck, and stored both in the station box and at the Caltrain railyard. The TBMs would be removed at Clarence Place where construction access is already planned, or further east if TBM is combined with SEM for the mined tunnel segment under Second Street (see description further below).

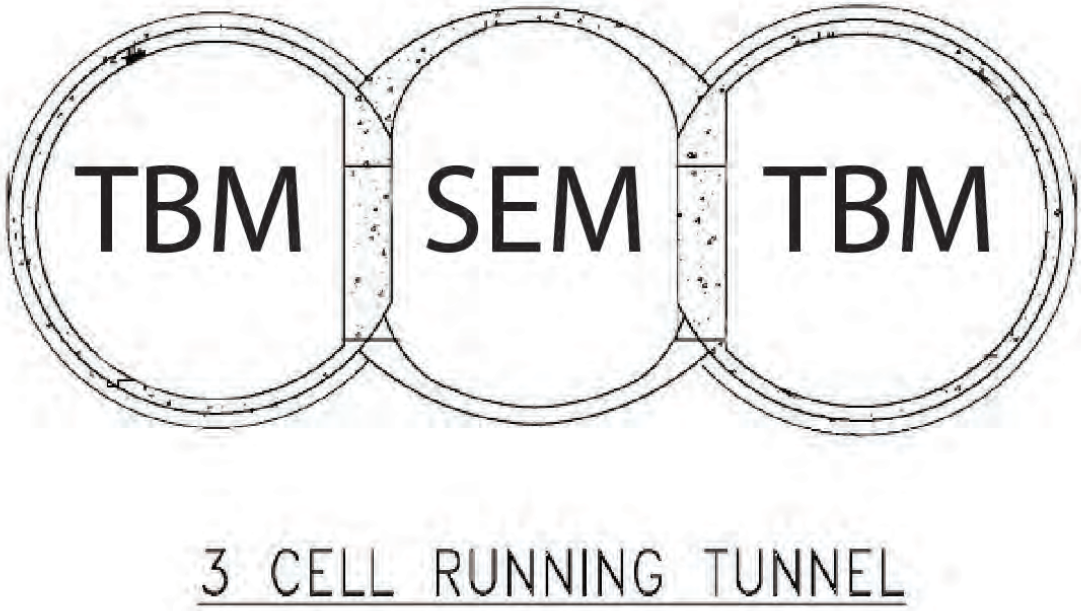

Figure 2-23 SEM with Tunnel Boring Machines

For operational flexibility and to better maintain train movements if one train becomes disabled in one of the tunnels, several crossover tracks are necessary so that trains can pass between sets of tracks. These crossovers require openings in the interior tunnel walls. The crossover tracks are also included as part of the SEM design, but that method would not involve interior walls separating the sets of tracks.

Similar to the SEM method and unlike cut-and-cover, compensation grouting would still be required to reduce potential settlement of the soft ground conditions which would involve grout pits as described above. This method for Townsend Street between Clarence Place and Fourth Street would cost approximately $71 million more (as inflated to the projected year of expenditure) than cut-and-cover construction, but would have the benefit of saving three months compared to the planned cut-and-cover construction schedule.

Use of TBM with SEM between the Intersections of Townsend Street/Clarence Place and Second/Clementina Streets. This segment is already proposed to be constructed using SEM. This option would add the use of TBM similar to the preceding option for the segment west of Clarence Place. The sequencing and construction of the tunnel would be identical to the previous description for the segment

west of Clarence Place. The difference would be the launch and removal points for the TBMs. If TBMs are launched from the Fourth and Townsend Station box, the TBMs would continue eastward under Townsend Street and turn north under Second Street, exiting at the point where it would meet the cut-and-cover segment at Second and Clementina Streets. The TBMs could be removed at two locations: in the Second Street cut-and-cover box and in the excavated parcels south of Howard Street. The addition of TBM in this segment would offer the same benefits described above for the segment along Townsend Street. In this segment, which is primarily underlain by rock, the potential for settlement is less than along Townsend, so that the benefit of using TBMs is largely that the tunnel can be constructed faster than with SEM alone and reduce the duration of construction impacts in this segment. This method for construction between the intersections of Townsend Street/Clarence Place and Second/Clementina Streets would cost approximately $26 million less (as inflated to the projected year of expenditure) than SEM construction, and would have the benefit of saving three months compared to the planned SEM construction schedule.

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 (SEM) or SEM with tunnel boring machines
• Cut-and-cover construction sections	• Jacked boxed tunnel at the Howard Street crossing • SEM or SEM with tunnel boring machines along Townsend Street, from Fourth Street to Clarence Place
• Stacked drift tunnel construction sections	• SEM or SEM with tunnel boring machines

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

Approved Phase 2 Transbay Program Components (No Action Alternative)	Proposed Project
• 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 • Emergency exit shafts at Second and Brannan Streets, and Second and Howard Streets	• 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 - One vent structure each at Third and Townsend Streets <u>(two options had been identified in the Draft SEIS/EIR, but the site at the northeast corner is now the preferred and only location)</u> 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

2.5 UPDATED SECTION 2.4, ALTERNATIVES PREVIOUSLY CONSIDERED AND REJECTED FOR FURTHER REVIEW

Section 2.4, as amended to include additional information about alternatives to individual project components and the reasons they are not evaluated further in this SEIS/EIR, is reproduced below.

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 by the City in 2004 and approved by FTA in 2005. This documentation is provided in Appendix B to the~~is~~ Draft SEIS/EIR.

The design of the DTX had advanced to Preliminary Engineering (or roughly 30 percent of final design plans) in 2010 and was based on the 2004 FEIS/EIR, a 2006 Final Tunnel Evaluation Report, and Geotechnical Interpretive Reports for tunnel design and for cut-and-cover design. The identification of DTX segments proposed for the cut-and-cover construction method and segments proposed for the mined tunnel method are based on these studies, and specifically reflect available information on considerations such as the corridor's geology, rock and soil properties, and groundwater data; the depth of construction; and construction schedule, sequencing, staging, and cost.

Following the release of the Draft SEIS/EIR in 2015, two additional studies related to DTX construction were undertaken:

- A Tunnel Options Study Report, dated November 7, 2017, and subsequent addenda completed in March 2018, were prepared by the TJPA to determine whether the impacts from cut-and-cover construction could be reduced by using other construction methods.

- In April 2018, a peer review panel convened by the San Francisco County Transportation Authority, issued a review of DTX rail operations, including consideration of whether a two-track DTX, instead of a three-track DTX, as proposed for the LPA, would be feasible.

Each of these studies considered modifications to the project assessed in the 2004 FEIS/EIR and subsequently approved by the TJPA and FTA. These studies are summarized below.

The Tunnel Options Study consisted of a review of construction methods that had the potential to reduce surface disruptions and socioeconomic impacts by increasing the extent of the mined portions of the DTX tunnel. Increasing the extent of mined tunneling would reduce surface disruption, which in turn would lessen circulation impacts on Townsend, Second, and Howard Streets; reduce air and noise emissions; and decrease the socioeconomic effects for residents and businesses along the DTX alignment. The tunneling options presented in the report were evaluated for construction risk, ground and groundwater conditions, land use impacts, environmental consequences, impacts to existing structures, schedule, and cost impacts to determine whether the tunneling options were technically feasible and schedule/cost effective. None of the options studied in this report was reasonable or feasible for the full length of the alignment because of subsurface soil and groundwater conditions, utility conflicts, rail profile, and design specifications. Designs indicating that DTX would need to be constructed through a combination of mining and cut-and-cover techniques were developed for the 2004 FEIS/EIR. Subsequent studies, including the Tunnel

Options Study, have continued to refine the study of the most appropriate construction techniques for different segments of the alignment.

As part of the Tunnel Options Study, a workshop was hosted by TJPA which included transportation agencies and engineering consultants with special expertise in tunneling that resulted in potential construction methods being advanced for further consideration. Tunneling options were examined for the DTX alignment by segment due to differing tunnel cross-sections and ground conditions, as summarized below.

Segment of DTX Alignment[1]	**Tunneling Options**
Second Street between Howard and Clementina Streets (Throat Structure) in the public right-of-way	The Tunnel Options Study reviewed mining in the public right-of-way (maintaining cut-and-cover on properties off the public right-of-way for construction access to mined tunnels). Due to complicated cross-sectional geometry of the Throat Structure, three options were assessed: • Mining the entire Throat Structure using a combination of micro tunnel boring machine (TBM) pilot tunnels with mining or a pipe roof with mining. • Mining under Howard Street only using jacked box pilot tunnels with mining. • Mining under a portion of Second Street between Howard Street and Clementina Street using a pipe roof.
Between Second/Clementina Streets and Townsend Street/Clarence Place (mined tunnel segment)	The Tunnel Options Study reviewed a second option to the planned Sequential Excavation Method (SEM) in this segment: • Use of TBM with SEM.
Townsend Street, between Clarence Place and Fourth Streets	The Tunnel Options Study considered the following options to this cut-and-cover segment: • Extend the planned SEM construction methodology on Townsend Street from the planned terminus at Clarence Place west one block to Fourth Street. • Use a TBM with SEM to Fourth Street. • Mining with a pipe roof. • Use of a jacked box with mining.
Intersection of Fourth/Townsend Streets	Due to the interface with the SFMTA's Central Subway project at the intersection of Fourth and Townsend Streets, this section was analyzed independently from the remainder of Townsend Street; however, the construction methods are the same (SEM and TBM with SEM) as the portion of Townsend Street between Clarence Place and Fourth Street, but with the addition of ground improvement techniques. A pipe roof and a jacked box tunnel were also assessed for this segment.

Source: TJPA, Tunnel Options Study Report, November 2017.

1 A fifth segment, the Fourth and Townsend Station, was also identified, but tunneling options to reduce or eliminate cut-and-cover construction were not advanced and was rejected in the initial screening due to soft ground conditions and the shallow depth for the station which makes tunneling infeasible.

After further study and workshops with tunneling experts, it was determined due to risk, schedule impacts, and costs that for the throat structure, mining under only Howard Street using jacked box pilot tunnels with a pipe canopy and mining was feasible and should be examined further to confirm that surface settlements and disruption would be an improvement on the cut-and-cover approach. For the planned mined tunnel portion and Townsend Street between Clarence and the Fourth and Townsend Street Station, both an extension of the SEM approach and a TBM with SEM mining between the two

TBM bores were feasible. These options are described further in this Final SEIS/EIR. Other options considered in the Tunnel Options Study but rejected are presented in Table 2-7 with the rationale for rejection.

The second study concerning the DTX that was completed after the Transbay Transit Center Draft SEIS/EIR was issued was a peer review study by the San Francisco County Transportation Authority to review DTX rail operations, including consideration of whether a two-track DTX, instead of a three-track DTX, as proposed for the LPA, would be feasible. A peer review panel of rail operations experts was convened and tasked with reviewing three different operational studies—considering the underlying operating schedule, train performance and alignment geometrics assumed and operations simulations performed, and offering recommendations. The peer review panel concluded in its "Peer Review Panel Report on Findings – Review of Three Operational Studies for the Design of the Caltrain Downtown Extension," that the third track, included as part of the adopted LPA, provides operational flexibility during normal operations and allows for efficient recovery from delays. Without this flexibility, a two-track configuration would be susceptible to unacceptable delays. This reason, along with others, is highlighted in Table 2-7 as the rationale for rejecting this alternative.

Other alternatives to the proposed project that were considered relate to ~~components involve~~ discrete components ~~refinements, modifications, or enhancements to~~ of 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 FTA and TJPA have considered options for several of the proposed project components.~~ These ~~options~~ alternatives, plus the alternatives studied in Peer Review Panel Report of Findings and in the Tunnel Options Study Report, and the reasons for their rejection, ~~withdrawal from further consideration~~ are summarized ~~shown~~ in Table 2-7.

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 as evaluated by TJPA during the design process and as suggested by comments on the Draft SEIS	Construct smaller radii, involving tighter turns, to avoid property impacts.	• Reduced operational speed • Potential reduction in Transit Center capacity • Greater risk of derailment • Increased maintenance requirements and costs • Greater wheel squeal/noise impacts • Potential limitation on the length of the trains • Non-compliant with published California High Speed Rail Authority Design Standards
	Greater horizontal curve radius as evaluated by TJPA during the design process and as suggested by comments on the Draft SEIS	Construct larger radius curve entering the train box to avoid property impacts on the eastern side of Second Street.	• More properties affected than the proposed project, resulting in greater land acquisition costs and displacement impacts
	Modified construction methods at 589 Howard Street, an	Remove the portion of the building over the widened throat structure	• Adverse effect under NEPA and significant unavoidable impact under

Table 2-7
Proposed Project Component Alternatives Considered but Withdrawn

Project Component	Alternative(s) Considered	Alternative Description	Reasons Why Rejected
	historic building as evaluated by TJPA during the design process	and reconstruct the building once DTX construction is finished.	CEQA to a contributing ~~historic~~ building to a historic district • Risk of inadvertent damage or loss of integrity during reconstruction phase • "Use" of a contributor to a historic ~~site~~ district where a prudent alternative exists that could avoid this Section 4(f) effect
Second and Harrison Streets Vent Structure	Alternative vent structure sites as evaluated by TJPA during the design process	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 as evaluated by TJPA during the design process	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
Intercity bus facility	Alternative sites as suggested by comments on the Draft SEIS/EIR	Consider other sites in the vicinity of the Transit Center.	• Alternative sites were previously proposed on a second bus deck and in the Lower Concourse, but are no longer reasonable or feasible because the second bus deck was eliminated and use of the Lower Concourse poses security concerns and operational limitations • Use of the AC bus deck at the Transit Center is a viable short-term location for the long-haul bus operators; however, continued use is not reasonable or feasible in the long term, because of the projected future demand for AC bus loading, unloading, and layover space at this location • Use of the Bus Plaza at the street level of the Transit Center is not reasonable or feasible because the frequency and number of scheduled service runs by

Table 2-7
Proposed Project Component Alternatives Considered but Withdrawn

Project Component	Alternative(s) Considered	Alternative Description	Reasons Why Rejected
			Muni would not permit space for long-haul bus operators to load, unload, and layover • Other sites near the Transit Center would not provide the same connect-ivity and access to other Transit Center transit services and, thus, would not meet the project's purpose and need. • Other sites would require additional land acquisition and potentially greater displacement than the preferred site. The proposed intercity bus facility site is directly above the extended train box - the land would have already been acquired and the land uses would have been cleared.
Taxi Staging Areas	Alternative loading spaces locations for taxi pick-up and staging as evaluated by TJPA during the design process	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
DTX Alignment	Alternative alignment as studied in the City's Railyard Alternatives and I-280 Boulevard Feasibility Study, now referred to as the Rail Alignment and Benefits Study (draft report issued May 2018)	Consider other routes (through Mission Bay or under Pennsylvania Avenue) or other vertical configurations (surface rail with trenched streets at the southern end of the project limits)	• A route through Mission Bay or a reconfigured alignment along the southern portion of the corridor by Mission Bay would be significantly more costly for negligible operational improvements, add constructability risks, extend the expected completion date for the DTX, and introduce new significant impacts associated with crossing Mission Creek, flood hazards, use of parklands, transportation/traffic around new stations, land acquisition of new above-ground structures, and possible disturbance to historic districts. • A Pennsylvania Avenue alignment would significantly increase the project costs, delay the completion date for the DTX, and result in significant operational challenges for Caltrain in the vicinity of the 22nd Street Station during construction. Potential new significant impacts related to construction traffic, noise and air emissions, groundborne vibration, and geotechnical hazards; land acquisition for new above-ground facilities, hazardous materials, and environmental justice. This alternative, if feasible, could be performed as another separate phase of the project.

Table 2-7
Proposed Project Component Alternatives Considered but Withdrawn

Project Component	Alternative(s) Considered	Alternative Description	Reasons Why Rejected
Track Configuration	Reduce number of tracks as studied in the 2018 SFCTA Peer Review Panel Report (final report issued on April 2, 2018)	Reduce number of mainline tracks in the underground segment between the Caltrain railyards and the transit center	• A two-track configuration would restrict reliable service and operational flexibility for rail service. If a train is delayed or disabled, service would be disrupted – not just locally, but throughout the Peninsula Corridor – since there would be no third track to allow trains to continue service in both directions by bypassing the disabled train). • The train box and throat structure have been constructed as part of DTX Phase 1. Reconfiguration of the throat structure and train box to accommodate a revised track alignment is considered to be technically infeasible and/or prohibitively expensive, in part because its construction accounted for the structural columns of the now completed Salesforce Transit Center, which is directly above the train box.
Tunneling Method	Opportunities for reducing cut-and-cover construction in the Throat Structure on Second and Howard Streets as studied in the TJPA's 2017 Tunnel Options Study and addenda that were completed in March 2018	Mining the Throat Structure (mining the entire Throat Structure, mining just under Howard Street, mining between Howard Street and Tehama Street, and mining between Tehama and Clementina Streets) was considered by: • Pilot tunnels using micro TBMs with mining • Pipe roof with mining • TBMs used for interior walls • TBMs used for outside walls	• Mining the entirety of the Throat Structure using pilot tunnels with micro TBMs with mining was rejected because it extends the construction schedule by a minimum of approximately one year, is very costly, and carries significant design and construction risks due to the complex geometry of the tunnel and the number of construction processes in this segment. The pilot tunnels using micro-TBMs with subsequent mining is complex and introduces considerable construction challenges. There is also potential for significant surface settlements that can be readily mitigated with cut-and-cover construction. • Mining under Second Street between Howard and Tehama Streets using a pipe roof with mining would be costly and would not reduce the cut-and-cover construction impacts for Second Street, because the segment between Tehama and Clementina Streets would remain in cut-and-cover. There would be minimal benefits of mining this segment, because surface disruption would still result, but at a greater cost and with schedule delays. The pipe roof with mining also has a risk of potentially excessive settlements.
	Opportunities for reducing cut-and-cover construction	Extend tunneling on Townsend Street between Clarence Place and the Fourth and Townsend Street	• The jacked box method was rejected because it would cause surface disruption similar to cut-and-cover at a

Table 2-7
Proposed Project Component Alternatives Considered but Withdrawn

Project Component	Alternative(s) Considered	Alternative Description	Reasons Why Rejected
	along Townsend Street as studied in the TJPA's November 2017 Tunnel Options Study and addenda that were completed in March 2018	Station including the Fourth Street crossing by: • Jacked box • Pipe roof tunnel	greater capital cost. Excavation in the existing soft ground conditions also results in potential stability risks for the light rail tracks and streets above. • Similar to the jacked box method, the pipe roof tunneling method was rejected for constructability issues. This method would require a reception pit for construction equipment removal that would result in surface disruptions similar to cut-and-cover but at a greater capital cost.
	Mining the Fourth and Townsend Street Station as studied in the TJPA's 2017 Tunnel Options Study and addenda that were completed in March 2018	Consider mining techniques in lieu of cut-and-cover	• The Fourth and Townsend Street Station includes a mezzanine that requires the top of the structure to be approximately 2 feet below the ground surface. Due to this shallow depth and the poor ground conditions, mining the station is infeasible and was rejected.

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2.6 UPDATED SECTION 3.1.4, DIFFERENCES BETWEEN CEQA AND NEPA

Section 3.1.4, Differences between CEQA and NEPA, as amended to address comments on the Draft SEIS/EIR regarding cumulative projects, is reproduced below.

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 2016~~3~~). 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.

Development in the Mission Bay Area (south of Townsend Street, east of Seventh Street, north of Mariposa Street) is described in the Mission Bay North and South Redevelopment Plans and the University of California San Francisco Long Range Development Plan (UCSF LRDP). These three plans have resulted in the transformation of the Mission Bay area into a new community, consisting of residential development, open space, research buildings, and health care facilities. With ongoing construction of UCSF facilities, as well as residential and commercial development within the Mission Bay South area, these three plans provide cumulative context for many of the resources in the Mission Bay area that may be affected by the proposed project, particularly the additional trackwork south of the Caltrain railyard. These plans were all adopted prior to the initiation of the RAB Study and do not include any of the RAB Study components.

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 20~~18~~20.	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.~~ The project is currently under construction.	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
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,	The building permit was filed on August 3, 2012.	SF Planning Development Pipeline

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

Project Number	Project Name/Location	Project Summary	Project Date	Source
		and 336 off-street parking spaces.		(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.~~ Draft EIR was released in December 2016. Plan adoption anticipated in 2018.	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

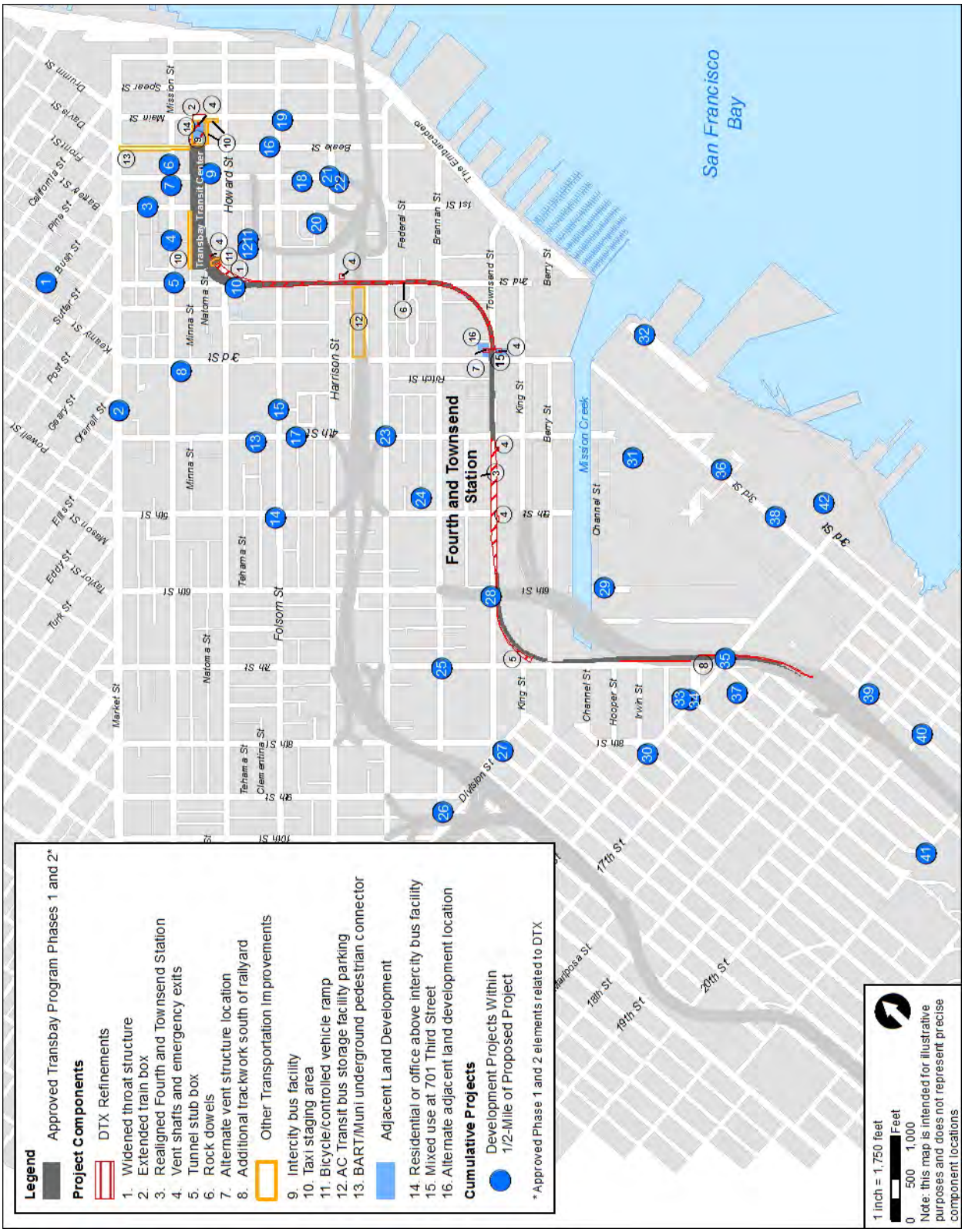
Table 3.1-1
Reasonably Foreseeable Projects Considered in the Cumulative Impact Analysis

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
43	California High-Speed Rail Authority (CHSRA) Business Plan, describing high-speed rail service through San Francisco along the Caltrain corridor to the Fourth and King Station and along the Downtown Rail Extension alignment.	Construction and implementation of the high-speed rail system pursuant to the CHSRA Business Plan, which is updated every other year, the most recent being the 2016 Business Plan approved by the CHSRA Board on April 28, 2016.	Passenger service between the Silicon Valley and the Central Valley by 2025, and connecting to San Francisco via the electrified Caltrain corridor.	http://www.hsr. ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf

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

Project Number	Project Name/Location	Project Summary	Project Date	Source

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

2.7 UPDATED SECTION 3.2, TRANSPORTATION

Section 3.2, Transportation, is reproduced below and is amended to address comments on the Draft SEIS/EIR, assess other construction methods, and incorporate updated information from Caltrain and additional studies.

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.

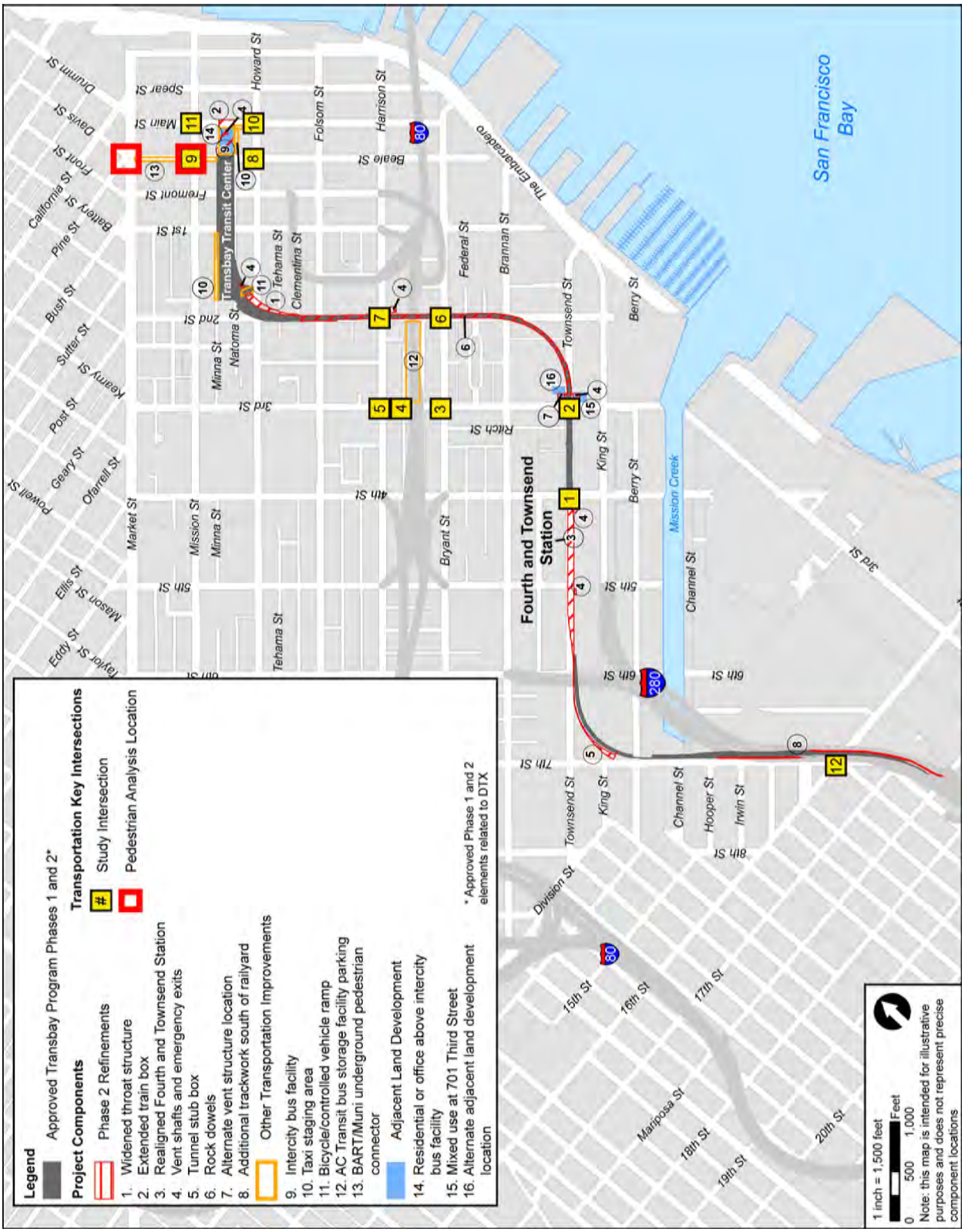
Howard Street is a major east/west roadway in downtown San Francisco running from The Embarcadero through SoMa to South Van Ness Avenue. Between The Embarcadero and Fremont Street, Howard Street operates as a two-way arterial with two travel lanes in each direction. West of Fremont Street, Howard Street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



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

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.

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 neighbourhood 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) and two other recently certified EIRs by City agencies.[2] 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)

[2] Relevant EIRs with data on Intersection 12 include the Transit Effectiveness Project (SFMTA 2014) and the Golden State Warriors Arena Project (SF OCII 2015). Information from these EIRs differs in the level of service at this intersection; therefore, this SEIS/EIR reports the most congested condition.

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.[3] 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.[4]

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

[3] 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).

[4] 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.

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

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~~ E	~~49.5~~ **68.6**

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 was used for Intersection #12 and contains more recent data than used for the other intersections; SF OCII 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, a 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

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~~C	7.6
	Southeast	A	18.5	~~A~~B	11.0
	Southwest	A	14.8	~~A~~C	8.2
	Northwest	B	12.9	C	7.6

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.

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.

Fixing America's Surface Transportation Act (2015)

FAST Act, Public Law 114-94 (49 USC Chapter 53), is the successor federal transportation legislation to MAP 21. The act largely maintains the program structure and funding shares between highways and transit established by MAP-21, but further speeds the permitting process and implements an improved system to track projects and interagency coordination. Over the 5-year duration of the act, the legislation provides for $305 billion for surface transportation improvements. The Capital Investment Grant program that funds fixed guideway improvements under Section 5309 identifies four categories of eligible projects: New Starts, Small Starts, Core Capacity, and Programs of Interrelated Projects.

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 act also recommends that the traditional method of evaluating traffic impacts (using level of service standards for roads and intersections) under CEQA be replaced by new methodologies, emphasizing vehicle miles traveled. The State issued proposed changes to the CEQA Guidelines and a proposed Technical Advisory on updating the analysis of transportation impacts under CEQA, most recently in January 2016. As of the date of this Final SEIS/EIR, the CEQA Guidelines have not yet been amended to change the criteria for determining the significance of transportation impacts. 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. In March 2016, the City Planning Commission adopted a resolution implementing SB 743 by replacing level of service with a vehicle-miles-traveled threshold for purposes of determining significant impacts pursuant to CEQA. The resolution represents the "Align" component of the City's three-part initiative to help transportation keep pace with growth in the city. Known as the Transportation Sustainability Program, the initiative is a partnership among the Mayor's Office, the San Francisco Planning Department, the San Francisco County Transportation Authority, and the San Francisco Municipal Transportation Agency. It is designed to improve and expand the transportation system and create a policy framework for private development to contribute to minimizing its impact on the transportation system.

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.

San Francisco Municipal Transportation Authority Transit Effectiveness Project/Muni Forward

The SFMTA's Transit Effectiveness Project (TEP) is made up of a service policy framework, service improvements, service-related capital improvements, and travel time reduction proposals. The improvements affect many Muni routes (bus and light rail) throughout the City. The TEP plans for 22 Fillmore bus route and changes along 16th Street are within the area of the proposed project. Along this corridor, the SFMTA plans a left-turn restriction from eastbound 16th Street to northbound Seventh Street. West of Seventh Street, the bike lanes on both sides of 16th Street would be removed, and new transit-only lanes in each direction would be installed west to Bryant Street. East of Seventh Street, the two existing outside (curbside) automobile lanes would be converted to transit-only lanes in each direction. The SFMTA Board of Directors approved the 22 Fillmore improvements on January 22, 2016. SFMTA anticipates project implementation will start in mid-2016, with striping of the new bike lane on Seventh Street, consolidation of bus stops, and striping of the transit-only lanes. By the end of 2019, more permanent street features such as transit and pedestrian bulbs, traffic signals, and extension of overhead wires will be complete, in addition to painting the transit-only lanes red.

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

The analysis of potential transportation impacts associated with the proposed changes to the Transbay Program was conducted according to the guidance and methodologies contained in Transportation Impact Analysis Guidelines for Environmental Review (2002) (Transportation Guidelines), published by the San Francisco Planning Department (Planning Department), and is consistent with the methodologies and assumptions used in the 2004 FEIS/EIR for the Transbay Program (FTA 2004), as well as the Transbay Program Final EIS Reevaluation (FRA 2010).

The following sections, along with Appendix C, Transportation Analysis Supplement, describe key facets of the analysis methodology and assumptions, as well as the incorporation of data and analyses from other EIRs into the assessment of the proposed project.

~~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).~~

Analysis Approach

Overall Framework. The transportation analysis evaluates the extent to which the proposed project affects the performance and safety of the circulation system. The proposed project components can be organized into three groups that require different analyses:

- Project components that would not affect the transportation network after construction – These components would involve trips and other activities during construction that could affect roadways, transit services, pedestrian/bicyclist facilities, parking/loading, or emergency access. After construction, however, there would be no effect, because these components would not generate travel demand or result in operational activities that would affect the performance and safety of the circulation system. They include the widened throat structure, the extended train box, the vent structures, and rock dowels. These components are almost entirely underground and their construction-related impacts would be similar to those described in the 2004 FEIS/EIR (see Section 5.20, Construction Staging and Methods).

- Project components that would affect the transportation network after construction – These components would involve trips and other activity during both construction and operations that could affect roadways, transit services, pedestrian/bicyclist facilities, parking/loading, or emergency access. There would be potential impacts during operations because these components would generate new, or alter existing, trips, or result in activities that would affect the performance and safety of the circulation system. They include the additional trackwork south of the Caltrain railyard, the intercity bus facility, the taxi staging area, use of the bicycle/controlled vehicle ramp, use of the AC Transit bus storage facility for public parking, and the adjacent land development. The transportation analysis for these components incorporates the construction-related analysis from the 2004 FEIS/EIR and focuses on their operational impacts.

- Project components that were previously evaluated in the 2004 FEIS/EIR but involve refinements that could affect the transportation network – These components were evaluated in the 2004 FEIS/EIR (and thus their impacts and mitigation measures, if needed, were identified) and approved as part of the Transbay Program. However, they have been refined as part of the proposed project and their potential transportation impacts are re-examined in this SEIS/EIR. They include the realigned underground Fourth and Townsend Station and the underground pedestrian connector, both of which are proposed for different locations than previously analyzed. Since these components were evaluated in the 2004 FEIS/EIR, the emphasis in this SEIS/EIR is the extent to which the refinements substantially alter the previous reported impacts and mitigations.

Furthermore, most of the project components are also specific enough in nature that potential impacts would be confined to specific modes or impact categories (e.g., traffic impacts, transit impacts, bicycle impacts, pedestrian impacts, and parking/loading impacts). Therefore, the analysis focuses only on those modes or impact categories relevant for each project component.

Analysis Scenarios. The analysis scenarios for the proposed project components can be divided into two types: one for analyzing the impacts of the turnback track and another for analyzing the impacts of the remaining project components. While all components are evaluated according to the same thresholds of significance described earlier (for the relevant modes or impact categories applicable to each component), the nature and context of the proposed turnback track requires analysis of potential impacts compared to a future baseline scenario (rather than existing conditions). Both approaches are consistent with the City's Transportation Guidelines and the State CEQA Guidelines.

The analysis scenarios for these two groups of project components are described in further detail below.

Analysis Scenarios for Proposed Project Components Except the Turnback Track. ~~In particular,~~ For all project components except the turnback track, the following scenarios were evaluated to identify the potential transportation impacts of the proposed project:

- Existing conditions – Generally representing existing physical conditions at the commencement of the SEIS/EIR transportation analysis in 2012 and 2013.

- Existing-plus-project conditions – Existing conditions plus the proposed project. Project-specific impacts are evaluated by comparing Existing plus Project Conditions against Existing Conditions, and then reviewing the difference relative to the thresholds of significance.

- 2040 cumulative conditions – Representing conditions for a cumulative horizon year (2040), with foreseeable land use and transportation changes. Cumulative impacts are determined by evaluating the proposed project in combination with past, present, and reasonably foreseeable future projects and comparing the difference between cumulative conditions with and without the project—or, in some cases, the project's contribution to future cumulative conditions—to the thresholds of significance.

Analysis of an existing-plus-project scenario and a future cumulative scenario to determine potential project impacts is consistent with the approach in the City's Transportation Guidelines and the State CEQA Guidelines.

Analysis Scenarios for the Turnback Track. In the case of potential impacts associated with the proposed turnback track, the analysis evaluates potential project-specific impacts compared to a future baseline condition in 2020 (rather than "existing conditions" in 2012 and 2013, as described above for other components of the proposed project). This approach is consistent with the analysis methodology adopted in the PCEP Final EIR for the analysis of the 16th Street/Caltrain Tracks (at Seventh Street) intersection and other intersections along the Caltrain corridor. While some of the other components of the proposed project, such as adjacent development at the vent structures and intercity bus facility, can be implemented independently, implementation of the proposed turnback track is predicated on prior electrification of Caltrain and other improvements proposed under the PCEP, which would not occur until 2020. Therefore, analyzing the project compared to existing conditions for this particular project component would not provide useful information because that component is not planned to be constructed without prior improvements being completed. Comparison to a future baseline condition in 2020 more appropriately reflects conditions at the expected time of implementation of the turnback track and allows the analysis to accurately describe the associated potential impacts of that project component. This approach, however, only concerns the analysis of project-specific impacts of the turnback track; cumulative impacts associated with this project component are evaluated for a horizon year of 2040, similar to the other project components.

After commencement of CEQA-initiated transportation analysis related to the PCEP, several major plans and projects have been approved in the area near the turnback track, including the University of California San Francisco Long Range Development Plan (UCSF LRDP) and the Golden State Warriors arena / event center and mixed-use development on Mission Bay South Blocks 29–32). In addition, subsequent changes have been proposed to the transportation network in this area as part of Transit Effectiveness Project / Muni Forward improvements under the 22 Fillmore Transit Priority Project.

Unlike the later certified UCSF LRDP EIR and Mission Bay South Blocks 29–32 Subsequent EIR, the PCEP EIR contained the most comprehensive analysis of the 16th Street grade crossing available at the time of commencement of the SEIS/EIR analysis. Furthermore, the PCEP improvements involve changes to the physical design/layout and train activity at the 16th Street crossing, similar to the types of changes proposed by the turnback track. The PCEP EIR also evaluated the effects of Caltrain electrification on the proposed reroute of the 22 Fillmore electric trolley bus through this grade crossing to Mission Bay. Therefore, the PCEP EIR was the most appropriate reference document for the purposes of analyzing the

potential effects of the turnback track, and the approach and results presented in this SEIS/EIR rely on and reference the PCEP Final EIR, where relevant.

Travel Demand

Travel demand refers to the vehicle, transit, pedestrian, and other trips associated with a given land use. 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~~ adjacent development at the vent structure sites and the intercity bus facility under the proposed project were estimated and compared to the existing trips from existing land uses at these locations that would be displaced ~~from the site~~ by the proposed project. ~~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~~ data and guidance contained in the City's Transportation Guidelines (including trip generation rates, mode share, and distribution of the trips on the transportation network) and the ~~travel demand~~ methodology and assumptions developed for the Transit Center District Plan FEIR (City of San Francisco 2012), which analyzes the potential impacts associated with the overarching community plan for the Transbay neighborhood and represents the most recent comprehensive transportation impact analysis for the area surrounding the Transbay Transit Center. As discussed in Section 2.2.2, the assumed land uses and development intensity at each of the development sites are consistent with applicable City plans and zoning.

Analysis Locations

Specific analysis locations for the intersection LOS (for traffic impacts) and crosswalk and street corner LOS (for pedestrian impacts) were selected based on their proximity to components of the proposed project, as well as the potential for components of the proposed project to negatively affect conditions at those locations.

In general, the magnitude of potential effects generally lessens with distance from a given project component. In the case of the intersection LOS and crosswalk and street corner LOS analysis, traffic and pedestrian activity generated by the proposed project would be most concentrated at the site of specific project components and the immediately adjacent intersections. At the next upstream or downstream intersection, impacts would be less noticeable because the trips would have diverted onto available intermediate streets and pedestrian routes. Therefore, the selected intersections represent the locations where the proposed project's potential to result in significant impacts to intersection LOS or crosswalk and street corner LOS is greatest.

Furthermore, most of the proposed project components are site-specific and result in localized impacts that have already been addressed in the 2004 EIS/EIR for the Transbay Program. Therefore, this analysis focuses only on those locations where an in-depth evaluation is warranted because the proposed project could result in new significant impacts that were not previously disclosed or could result in impacts substantially more severe than previously reported.

Development of Cumulative Conditions

Development of the cumulative analysis scenario relies on a combination of data from various sources including travel demand forecasting models and previous environmental documents. Consistent with the San Francisco Planning Department's standard approach, background growth in travel demand, including traffic and pedestrian volumes, was derived from forecasts produced by the San Francisco Chained Activity Modeling Process (SF-CHAMP) travel demand forecasting model maintained by the San Francisco County Transportation Authority.

SF-CHAMP. The SF-CHAMP forecasts are developed from county-level population and employment growth estimates developed by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) for the nine-county Bay Area for use in MTC's regional travel demand forecasting model. Because the county-level data are not sensitive enough to enable transportation analyses for smaller geographic areas or corridors, the Planning Department further disaggregates the projected growth into "traffic analysis zones" that are defined in the City's travel demand model. This more precise allocation specifically accounts for major land use changes projected to occur within the cumulative timeframe (year 2040) such as those approved in community plans (e.g., Transit Center District, Central SoMa Area, and the Eastern Neighborhoods), major redevelopment areas (e.g., Mission Bay, Parkmerced, Treasure Island / Yerba Buena Island, and Candlestick Point / Hunters Point Shipyard), and large development projects (e.g., Visitacion Valley, Executive Park, India Basin, and Pier 70).

In addition to land use changes (and associated changes in population and employment), SF-CHAMP also includes major reasonably foreseeable transportation investments including the Transit Effectiveness Project / Muni Forward; the Central Subway and associated improvements to the T Third Street; Van Ness Avenue Bus Rapid Transit; Geary Corridor Bus Rapid Transit; the M Ocean View extension into Parkmerced; and expanded ferry service.

~~The 2040 Cumulative Conditions were developed using output from the San Francisco County Transportation Authority's travel demand model (the "SF Model"),[5] 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.~~

Future traffic volumes at the study intersections were derived by calculating annual growth rates for the roads approaching the intersection. The growth rates were developed by examining the change in the roadway volumes from the base-year (2012) and future-year (2040) SF-CHAMP model runs. Background growth in pedestrian activity within the study area was derived similarly from growth rates calculated for forecasted pedestrian trips in SF-CHAMP's trip tables for the "Downtown" and "SoMa" neighborhoods. These calculated growth rates were then applied to the Existing Conditions data (i.e., the field counts) to arrive at volume forecasts for 2040 Cumulative Conditions.

Adjustments to Forecast Volumes. The forecast volumes described immediately above provide useful future baseline data, but may not reflect additional information on travel behavior or changes to the transportation network at specific locations. Accordingly, adjustments were made to the forecasted traffic and pedestrian volumes or other associated analysis inputs at specific study locations. Such modifications were performed specifically for project components around the Transit Center to better account for future changes to the roadway network proposed by the Transit Center District Plan and the Central SoMa Plan and changes in travel demand and travel behavior described in the Transbay Program Final EIS Reevaluation (FRA 2010), which specifically evaluated the potential impacts of the DTX, the train box, and Caltrain and HSR passenger activity at and around the Transit Center in relation to the environmental effects of the Transbay Program already disclosed in the 2004 FEIS/EIR.

~~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~~

[5] ~~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.~~

~~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.~~

Use of the PCEP EIR and the Central SoMa Draft EIR. In the case of potential cumulative impacts associated with the proposed turnback track, the analysis describes and incorporates the approach and results from the PCEP Final EIR, similar to the analysis of project-specific impacts. A similar approach was also adopted for potential cumulative impacts associated with the realigned Fourth and Townsend Street Station, where the analysis and results describe and incorporate information from both the PCEP Final EIR and the Central SoMa Area Plan Draft EIR.

In particular, the PCEP Final EIR includes a future cumulative analysis of traffic impacts at the 16th Street crossing that accounts for future Caltrain electrification and increase in service, the Muni Forward transit improvements along 16th Street, potential high-speed trains, and background growth in the Mission Bay area. This EIR also provides an analysis of potential pedestrian impacts at the existing Caltrain Fourth and King Station associated with additional Caltrain service. The Central SoMa Plan Draft EIR considers the effects of the substantive areawide land use and transportation changes proposed under the Central SoMa Plan, including specific development proposals on parcels in the immediate vicinity of the station. Information and analyses from these documents is used for the cumulative analysis of the turnback tracks and the Fourth and Townsend Station realignment to more accurately reflect other changes in these areas and to be consistent with the most relevant environmental documents at these sites.

~~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.

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~~ D of the~~is~~ Final 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~~ D of this Final~~e Draft~~ SEIS/EIR. Further explanation and discussion of the methodologies, assumptions, and other EIRs used to evaluate the proposed project are presented in Appendix C of this Final SEIS/EIR.

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, or cause major traffic hazards. (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. As described earlier under the "Analysis Approach" section, m~~M~~any of the proposed project components would not result in any change to travel demand~~,~~ or result in, operational activities that would affect the performance and safety of the circulation system (e.g., 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. As described earlier under the "Analysis Approach" section, these components involve trips and other activity during both project construction and operations that could affect traffic operations, as well as refinements (to components previously evaluated in the 2004 FEIS/EIR) that could affect traffic operations. Specifically, t~~T~~hese 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. Furthermore, as explained in the "Analysis Approach" section, impacts associated with the additional trackwork south of the Caltrain railyard are based on a future 2020 baseline without and with this proposed project component. The other project components are evaluated based on existing conditions without and with the project component.

~~**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.[6] 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~~ This vent structure location is the preferred site, and its development ~~discussed above, this proposed project component~~ would displace the existing 41,125-

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

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.

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 3.2-6~~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~~ near 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 and underneath the elevated I-280 freeway structure. The only through street that would be crossed by the turnback track would be 16th Street. The turnback track would not cross streets to the north and south (i.e., Mission Bay Drive and Mariposa Street, respectively).

The maintenance-of-way track is used to store track maintenance equipment, and is currently located at 16th Street east of the mainline tracks. The proposed project would relocate this track to the west side of the mainline tracks, and the turnback track would be built in the former location of the maintenance-of-way track. The maintenance-of-way track would extend from about Hooper Street on the north to a point north of the intersection of Seventh, 16th, and Mississippi Streets; this track would not cross any City streets.

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~~ 1670 Owens Street ~~on the UCSF Campus~~; and

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

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

Table 3.2-~~67~~
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. Although traffic data for nearby Intersections #1 and #2 were collected in 2012 and could be different now at the time of the Final SEIS/EIR, the adjacent land development would result in a net reduction of trips from the site, and therefore would not contribute more trips or contribute to further delays at the two relevant study area intersections.
[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

In addition, potential delays in traffic operations are anticipated because of train movements along the turnback track, which would ~~create~~ add~~itional~~ to the delays ~~beyond those~~ identified in the PCEP EIR due to existing and future Caltrain service. ~~Although operating plans for~~ Caltrain, in consultation with the California High-Speed Rail Authority and the TJPA, is planning for ~~have not been finalized, the number of~~ 24 train crossings of 16th Street along the turnback track ~~could be between 10 and 40~~ per day ~~according to Caltrain staff~~ (see Table 2-3a in Chapter 2, Project Alternatives), with ~~few expected~~ none during the weekday AM and PM peak hours. ~~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).~~ This information takes into account a typical Caltrain schedule and includes the maximum number of trips per day using the turnback track in order to present a conservative analysis of the potential impacts.

Train movements along the turnback track 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 pedestrians. Based on the schedule developed by Caltrain, ~~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~~ affect intersection operations and delays during off-peak hours only. The grade crossing is an existing condition that predates the redevelopment of the Mission Bay area, and is currently used by 92 trains per day during a typical weekday. An analysis of gate downtime with and without the turnback track shows that the overall change in gate downtime would be about 28 minutes over the course of the entire day (see Table 2-3b in Chapter 2, Project Alternatives), in addition to approximately 107 minutes in the existing condition due to Caltrain service.

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. It should be noted that the PCEP EIR did not explicitly take into account local transit improvements or land development projects that were not adjacent to the Caltrain right-of-way. The cumulative analysis did, however, examine potential conflicts between the Electrification Project and the 22 Fillmore Transit Priority Project. Because of approved changes to the roadway network, which include the conversion of two automobile traffic lanes on 16th Street to transit-only lanes, and the increased development intensity associated with the Warriors project, both the Transit Effectiveness Project EIR and the Warriors Arena Project EIR identified the impacts at the intersection of 16th and Seventh Streets to be significant and unavoidable.

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. However, the turnback track would not disturb traffic operations during the AM/PM peak hours, which is the critical period upon which intersection effects are based. In addition, all physical changes to the crossing would be designed according to relevant design guidelines and standards (such as the *Manual on Uniform Traffic Control Devices*) to ensure safety for all roadway users (including motorists, transit riders, bicyclists, and pedestrians), and the quality of traffic controls and warning devices at the crossing would be expected to remain similar to, or improve from, existing conditions. As a result, the proposed project would have a not adverse traffic effect under NEPA and a less-than-significant impact under CEQA.

The turnback track would not cross Mariposa Street and Mission Bay Drive; thus, movement of Caltrain trains from the railyard to the Transit Center and vice versa would not result in additional traffic delays on these streets. It is conceivable that motorists wanting to cross Seventh Street and the Caltrain tracks during off-peak hours could divert from 16th Street to these other streets, but the time for motorists to divert to these streets would not likely be substantially different from the time it would take the motorists to wait for the train to cross 16th Street (gate downtime). As a result, the amount of diverted traffic is not expected to be substantial, and the potential increase in traffic at Mariposa and Mission Bay Drive from the proposed project would most likely occur during off-peak hours. Therefore, the traffic impact to these streets would be less than significant.

~~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*~~ *Improvement Measure.* Since publication of the Draft SEIS/EIR, Caltrain has committed not to use the turnback track during the AM and PM peak hours (7:30 a.m. to 8:30 a.m. and 4:30 p.m. to 5:30 p.m.) because Caltrain's proposed schedule at the Transit Center does not require the use of the turnback track during this period and because it would avoid impacts to peak period traffic (Caltrain 2016). As a result, based on current best operating and service assumptions, traffic impacts at the at-grade crossing of the turnback track would be less than significant. To further reduce these less-than-significant impacts, the following improvement measure / environmental commitment is recommended:

New-I-TR-1.1 *Traffic Improvement and Adaptive Management Plan.* A traffic improvement plan and adaptive management plan will be developed for the two at-grade intersections along the turn-back track length (7th Street/Mission Bay Drive and 16th Street/Mississippi Street/7th Street) which will outline all aspects of avoiding, minimizing, and compensating for all temporary and permanent impacts associated with the project. The traffic improvement plan will be reviewed and approved by the City and County of San Francisco prior to implementation.

Final monitoring requirements for the area will be determined through coordination with regulatory agencies (including San Francisco, Caltrain and California High Speed Rail Authority (CHSRA)) and details will be included in the improvement plan approved by the City and County of San Francisco. A minimum of two monitoring events of the compensatory mitigation will take place after implementation for the first six years after implementation (or until CHSRA serves San Francisco whichever comes first), and one monitoring event for three additional years is required. Additional monitoring after this time period may be necessary based on impacts and any adaptive management applied.

After each monitoring event, a report will be submitted to the City and County of San Francisco which will include, but not be limited to, a narrative of the site conditions, representative analysis including traffic counts, gate down time, and delays, and the performance metrics included in the City and County of San Francisco-approved mitigation plan.

Should future service requirements and operational plans result in the need to use the turnback track and cross 16th Street during these critical travel periods, the following mitigation measure would be implemented to address potential traffic effects. Additionally, depending on the conditions and circumstances that exist if and when Caltrain determines that use of the turnback is needed during the AM/PM peak hours, further CEQA and NEPA review may be required. ~~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 requires that a ~~this~~ traffic/train operation analysis would be conducted by TJPA in coordination with Caltrain in the event that Caltrain changes its commitment in the future and uses the turnback track during the AM/PM peak hours. The purpose of the analysis would be to identify traffic impacts along 16th Street due to Caltrain operations along the turnback track and feasible mitigation measures. ~~during final project design and~~ If needed, t~~T~~he ~~resulting~~ mitigation measures would include traffic and crossing signal modifications, lane configurations, queue storage, and/or other improvements to achieve the performance standard specified in New MM-TR-1.1 of no greater than a 10 percent increase in additional traffic delays at the 16th and Seventh/Mississippi Street intersection and the 16th and Owens Street intersection due to the proposed change in Caltrain operations~~ the signal timing and phasing along 16th Street~~, if warranted, and would reduce future traffic impacts, if any ~~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 traffic effect would occur under NEPA, and a less-than-significant impact would occur under CEQA. Mitigation for impacts to bicycle and pedestrian circulation and safety are addressed under Impact TR-3 and in New-MM-TR-3.1, which will be coordinated with New-MM-TR-1.1.

New-MM-TR-1.1 Modify Signal Operations at the 16th Street Intersection with Seventh Street/Mississippi Street, 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~~If Caltrain service and operations plan requires the use of the turnback track during the AM/PM peak hours in the future, prior to Caltrain making any such changes, the TJPA, in conjunction with Caltrain, shall conduct further traffic and train operation analysis of the turnback and maintenance of way tracks to evaluate traffic~~, pedestrian, and bicycle~~ operations along 16th Street at Seventh/Mississippi Street, the Caltrain ~~/~~turnback track~~s~~, and Owens 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/train operation analysis shows that the traffic delays attributable to the gate downtime during the AM/PM peak hours would increase at Seventh/Mississippi Street or at Owens Street (already operating at LOS E and F) such that the overall intersection v/c ratio would worsen by more than 10 percent (i.e., a v/c ratio increase of more than 0.10), then improvements shall be implemented so the resulting v/c ratio is no greater than 10 percent above the v/c ratio without use of the turnback track during the AM/PM peak hours. Actions or improvements that could achieve the performance standard, either individually or in combination, include but are not limited to:

- Signal timing adjustments;
- Signal phasing modifications;
- Lane reconfiguration/re-striping in conjunction with phasing modification;
- Left-turn pocket lengthening;
- Pre-empt, pre-signal or queue cutters provision or modification as necessary to manage queues; and/or
- Other improvements identified in the future due to technology advancement.

~~the intersections along 16th Street do not meet the City's service levels for automobile traffic and pedestrian and bicycle circulation, the~~ The TJPA and Caltrain ~~will~~ shall coordinate with the City and ~~will~~ shall be responsible for reasonable costs of design, permitting, and construction of the ~~implementing~~ necessary ~~changes~~ improvements at these crossings to attain the v/c performance standard ~~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~~. These changes to the crossing will also satisfy the performance standard for safe pedestrian and bicycle circulation identified in New-MM-TR-3.1.

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.[7] Assuming bus schedules would be coordinated with the arrival and departure of HSR services at the Transit Center, the level of bus activity would be equivalent to approximately five buses for each combined arrival and departure (assuming two HSR arrivals and departures an hour, as reported by Caltrain in the conceptual schedules for blended Caltrain and HSR service for the Peninsula Corridor Electrification Project). 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, t~~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 part of the Transbay Block 5 (Park Tower at Transbay) development. 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 3.2-7~~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.[8] 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. Including the bus activity at the intercity bus facility (up to 10 buses per hour in both the inbound and outbound directions), the net increase in traffic activity during the weekday AM and PM peak hours would be less than 10 vehicles per hour, because there is already some amount of intercity bus activity in the area associated with current Amtrak and Greyhound operations. ~~Because of this reduction in overall vehicle trip generation, the proposed intercity bus facility plus adjacent land development~~ Considering the existing traffic volumes on the local roadway network during the weekday AM and PM peak hours, this magnitude of change in traffic activity 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.

[7] 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.

[8] Based on estimated 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-~~7~~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. Although traffic data for nearby Intersections #8 through #11 were collected in 2012 and could be different now at the time of the Final SEIS/EIR, the adjacent land development would result in a net reduction of trips from the site, and therefore would not contribute more trips or contribute to further delays at the four relevant study area intersections.
Source: Compiled by AECOM in 2014

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 and minimize conflicts with traffic, transit, bicycle, and pedestrian safety and circulation. In particular, the proposed intercity bus facility would not result in significant impacts to traffic safety or circulation along Beale Street. Bus activity along Beale Street related to the proposed intercity bus facility would consist of buses exiting the facility and turning left (south) onto Beale Street. This movement would not be expected to cause queuing effects (traffic backing up along Beale Street) because buses would be exiting the facility and entering the one-way southbound traffic flow along Beale Street. Under this egress-only design, bus queuing would be confined within the intercity bus facility. 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 or cause a major traffic hazard. 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 and traffic safety.

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~~ effect on traffic circulation 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 and traffic safety.

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, resulting in changes to the levels of service for Intersections #3 through #7. This proposed project component would not require design changes to the AC Transit bus ~~proposed project component~~ facility, and would not introduce design features that would negatively affect the safety and operations of the surrounding transportation network. ~~Thus~~In particular, parking at the AC Transit bus storage facility would not cause a major traffic hazard (the parking facility would function similar to many other existing parking facilities in the surrounding area), nor 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.[9]

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.

Under either case, the underground pedestrian connector would primarily be focused on below-grade circulation for pedestrians, and would not involve substantial physical changes to the street network that could cause major traffic hazards.

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 3.2-67, development at the~~is ~~alternate~~ vent structure site with ~~and~~ potential

[9] Although pedestrian count data for nearby crosswalks and street corners were collected in 2012 and could be different at this time, the underground pedestrian connector would result in a net reduction of pedestrians at street level, and therefore would not contribute more trips or contribute to further congestion at the two study area intersections.

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.

Use of the turnback track would interfere with service on the 22 Fillmore bus route. There are currently 317 scheduled trips of the 22 Fillmore throughout the day, with a relatively small percentage affected during the off-peak hours when the turnback track is anticipated to operate. The scheduled travel time for the entire route is 45 minutes to 55 minutes, depending on the time of the day. The delay of 70 seconds per crossing of 16th Street due to use of the turnback track would be comparable to typical automobile delay during one signal cycle at a signalized intersection with high volumes and multiple turning movements. As a result, the 28 minutes of gate downtime throughout an entire day would affect bus service, but this would not be a substantial delay so that the impact would be not adverse under NEPA and less than significant under CEQA.

Intercity Bus Facility and Adjacent Land Development. As shown in Table 3.2-7~~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,[10] the proposed residential development

[10] 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.

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.

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.[11]

Pedestrian volumes and entries/exits at the Fourth and Townsend Street Station would not be different from the No Action Alternative, because the proposed project would involve only a realignment of the station and a modification to its profile. As discussed further under Impact CU-TR-8, this proposed project component, which would be constructed as part of the DTX during Phase 2 of the Transbay Program, would be expected to lessen pedestrian volumes and impacts on sidewalks and street corners, compared to future conditions without DTX. As a result, pedestrian impacts would be not adverse/less than significant.

~~**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 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 3.2-6~~7~~, development of the~~is alternate~~ vent structure site with ~~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

[11] 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.

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. The additional distance and time required to traverse the "track zone" could pose safety hazards for pedestrians, resulting in a potentially significant/adverse effect.

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, would reduce impacts for pedestrians and bicyclists to not adverse under NEPA and less than significant under CEQA. New-MM-TR-1.1 addresses modifying signal operations at the 16th Street intersection with Seventh/Mississippi Street, the Caltrain tracks, and Owens Street to address traffic effects and requires that any changes to the crossing take into account safe bicycle and pedestrian circulation identified in New-MM-TR-3.1. ~~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.~~

New-MM-TR-3.1 Modify 16th Street Intersection with the Caltrain and turnback track to provide a safe crossing for pedestrians and bicyclists. At the time of the construction and operation of the proposed turnback track, the Caltrain electrification project (including mitigation measures adopted by Caltrain for this intersection), SFTMA's 22 Fillmore Transit Priority Project, and the Warriors Arena project may have been implemented. The combination of these projects will modify the intersection configuration and operation at the time of the proposed project. As a result, the TJPA is using a safety-based performance standard, explained below, to guide future improvements for pedestrian and bicyclist safety.

At the time of final design, TJPA shall determine the then-current overall time required by pedestrians and bicyclists traveling along 16th Street to cross the Seventh Street/Mississippi Street intersection, the Caltrain mainline tracks, and the turnback track, and the TJPA shall coordinate and consult with Caltrain, the California Public Utilities Commission, and the City to identify the changes to the intersection and grade crossing warning devices, including signal timing, that are needed to provide adequate time, as determined by the Institute of Transportation Engineers, Caltrans, and the City, for pedestrians and bicyclists to safely cross the widened intersection that results from the construction of the turnback track.

The TJPA shall commit to implementing changes necessary to protect pedestrians and bicyclists from potential safety issues, prior to operation of the new turnback track. Specific changes are expected to be determined during final design, which will be after the location of the crossing gates for the turnback track along 16th Street has been determined and based on the then-current signal timing at that time and which is expected to account for other major development and transit projects in the vicinity. The changes to the intersection due to the turnback track will be included in the design specifications for the project. Possible improvements that may attain the above performance standard include:

- Adjust signal timing for the warning devices and adjacent traffic signals. The warning phase before the gates start to come down shall be extended to take into account the additional time needed for pedestrians and

bicyclists to clear the track zone based on industry standards (such as the Caltrans California Manual on Uniform Traffic Control Devices or the Institute of Transportation Engineers' Design and Safety of Pedestrian Facilities) or City guidelines that define the walking speed of a pedestrian.

- Provide sufficient refuge areas for pedestrians and bicyclists to wait while the crossing gates are down. The refuge, or waiting, area shall be sufficient to accommodate the projected pedestrians and bicyclists and be ADA compliant.

- Install a smooth surface in the areas next to and between the rails to reduce tripping hazards and unintended forces on bicycle tires.

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.

Pedestrian activity associated with the proposed intercity bus facility would be expected to consist of passengers primarily transferring between regional and long-haul intercity buses at the facility and connecting modes (primarily Caltrain and high-speed rail, but potentially other transit operators) at the Transbay Transit Center. As indicated in Figure 2-15 of the Draft SEIS/EIR, the proposed intercity bus facility would include escalators, elevators, and stairwells to connect to the (below-grade) lower concourse level of the Transbay Transit Center, where passengers would have direct access to and from the train platform level. In addition, passengers would be able to connect directly to BART and Muni service on Market Street through the proposed underground pedestrian connector, which would link the Transit Center with the BART/Muni Embarcadero Station. For these reasons, the majority of pedestrian activity associated with the intercity bus facility would have little effect on the streets adjacent to or in the immediate vicinity of the intercity bus facility.

As shown in Table 3.2-7~~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~~ this vent structure site with ~~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 3.2-6~~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-3~~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 3.2-7~~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.[12] 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~~

[12] 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.

~~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~~ this vent structure site with ~~and~~ potential professional office/light industrial building that would replace the existing land uses (see Table 3.2-6~~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.

Additional Trackwork South of the Railyard. The additional trackwork south of the railyard would involve an at-grade crossing of 16th Street but would not be expected to substantially affect parking and loading for businesses and residences further east along 16th Street. Neither the proposed turnback track nor the MOW track would require removal of parking lanes or generate the need for additional service or maintenance vehicle access. The turnback track, as shown in Table 2-3b, would result in additional delays for vehicles, pedestrians, and bicyclists that travel along 16th Street; however, the delays would occur during off-peak hours and total about 28 minutes spread throughout the non-peak periods of each day.

As discussed in Impact TR-1, the at-grade crossing could affect queuing at the service and parking entryway for businesses along Owens Street. The service and parking garage entrance for businesses along Owens Street and north of 16th Street is on the north side of 16th Street, east of the Caltrain tracks and the proposed turnback track. Queues that form at the grade crossing due to use of the proposed turnback track would be temporary, and would generally be expected to dissipate within one to two signal cycles following the reopening of the crossing. Vehicles attempting to service the building at 1700 Owens Street or access the parking garage at 1670 Owens Street would continue to have access to the buildings as they currently do, although there may be a slight increase in delay when attempting to enter or exit the curb cut along 16th Street. The proposed turnback track and associated congestion and queuing would not, however, preclude access to and from the curb cut. The increase in delay entering and leaving the curb cut due to the turnback track likewise would not be substantial enough to constitute a significant impact on local circulation and access for the buildings.

Because this proposed project component would not result in the need for additional loading spaces, remove existing loading and/or parking spaces, or result in significant delays for loading activities, the impact would be not adverse under NEPA and less than significant under CEQA.

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.

The only proposed project component that crosses a local city street at grade and could affect emergency responders is the proposed turnback track that would cross 16th Street. Emergency vehicles on this street already cross the two Caltrain mainline tracks and would experience additional delay with the proposed turnback track and the need for longer gate downtimes. At other signalized intersections, emergency vehicles can pass through the intersection at reduced speeds even when receiving a red signal indication. However, where there are passing trains, emergency vehicles would not be able to cross through the at-grade crossings when the railroad gates are down. The gate downtime of 70 seconds for each train crossing on the turnback track would result in an additional 28 minutes of delay at this intersection spread throughout the non-peak periods of the day. The 70 seconds of delay would be comparable to typical automobile delay during one signal cycle at a signalized intersection with high volumes and multiple turning movements.

The emergency room and urgent care center for the UCSF Children's Hospital are located at the southern end of the medical center. Emergency vehicles and other persons heading to these facilities can use Mariposa Street, which would not be crossed by the proposed turnback track, as a primary access route now that it is widened to five lanes and the intersection with Fourth Street signalized. Notwithstanding the access improvements along Mariposa Street, 16th Street will continue to be used for access to the emergency room and urgent care facility. The planned 22 Fillmore Transit Priority Project will provide transit-only lanes on 16th Street. These lanes are expected to have fewer automobiles than the adjacent

automobile lanes and would not have any turn restrictions. These less heavily trafficked transit lanes can be used by emergency vehicles if necessary. In addition, alternate routes are available, such as using Missouri, Connecticut or Arkansas Streets to divert off 16th Street to Mariposa Street. Hubbell, Irwin and Carolina Streets can be used to divert from 16th Street to Mission Bay Drive.

Personnel from the police and fire stations, located at Public Safety Building on Third Street between Mission Rock and China Basin Street can use Third Street and Fourth Street to access the hospital and this portion of Mission Bay without being affected by the turnback track. Similarly, they can access US 101 and I-280 via Third Street and Fourth Street to Bryant Street without being impacted by the turnback track.

Because delays would be spread throughout the day, emergency responders typically have wayfinding equipment that enable them to follow the quickest routes, and alternate routes are available into and out of the Mission Bay area, impacts to emergency vehicle access are not adverse under NEPA and less than significant under CEQA.

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.

Other Construction Methods. After the release of the Draft SEIS/EIR, the TJPA initiated a Tunnel Options Study, intended primarily to explore construction methods that could further reduce the intensity and duration of construction impacts. The methods that were recommended for further evaluation affect selected segments of the alignment (see Figure 2-21). The Tunnel Options Study concluded that cut-and-cover segments along Second Street and Howard Streets at the widened throat structure and along Townsend Street (between the realigned Fourth and Townsend Station and the Clarence Place) could also be constructed using mining techniques, described in Section 2.4 of this Final SEIS/EIR. Additionally, the segment proposed for a mining technique known as Sequential Excavation Method (SEM) construction (from Townsend Street at Clarence Place to Second Street at Clementina Street) could also be constructed using a combination of SEM and tunnel boring machines. Use of these other construction methods, especially where cut-and-cover construction is proposed, would reduce construction-related transportation effects, because tunnel construction would occur almost entirely underground and thereby lessen the impacts to street-level vehicular, pedestrian, and bicycle circulation, as described further below. The determination of which construction method is appropriate for the proposed project will be made following further design and evaluation of the construction methods' cost and schedule implications, constructability, and environmental and public policy considerations.

The 2004 FEIS/EIR (Section 5.21.2) evaluated both cut-and-cover and tunneling methods for the DTX project. While the length of this segment is different than that identified in the Tunnel Options Study for tunneling, the comparative analysis of cut-and-cover versus tunneling methods is informative and applicable to this assessment. Cut-and-cover construction was identified as the worst-case scenario, largely because the volume of excavated materials and the resulting number of truck trips and traffic impacts were substantially greater than tunneling using mining techniques. It was estimated that mining techniques like SEM could generate about 20 percent less total excavated material (see Tables 5.20-4 and 5.21-2).

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. The other construction methods that reduce street-level disturbance or shorten the duration of construction would further reduce the not adverse/less-than-significant construction impacts, compared to construction methods described in the Draft SEIS/EIR. 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.

  The above construction scenario reflects the cut-and-cover construction technique. As described in Section 2.4 of this Final SEIS/EIR, a portion of the widened throat structure, specifically the Howard Street crossing, could be constructed using a jacked box tunnel with a pipe canopy. This method would excavate the tunnel from below the street surface, thereby substantially reducing

the traffic delays, detours, access, and circulation/parking/loading impacts that would occur around the Howard/Second Street intersection with the cut-and-cover technique. The cut-and-cover construction method would excavate from the street level down and create an opening at the street level, disrupting circulation until the street could be decked. Construction staging and access for the equipment for this construction method would use the same areas identified above for the cut-and-cover method (in general, the northeast and southeast corners of the Howard/Second Street intersection, where properties are already identified for acquisition in the 2004 FEIS/EIR), and would not require additional space. The number of truck trips for soils removal during tunneling would be less than that for the cut-and-cover construction method, because of the smaller volume of soil to be excavated. Nevertheless, the reduction in truck trips and soil disposal would not be substantially different than for cut-and-cover construction, because this segment is relatively short, covering approximately 230 feet along Howard Street and 80 feet across Howard Street. As a result, this construction method could reduce potential traffic delays and detours associated with cut-and-cover construction, and would not result in new or substantially more severe adverse/significant impacts that cannot be mitigated by the mitigation measures approved in the 2004 FEIS/EIR and incorporated into the proposed project.

- **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.

- **DTX Alignment Segments with Possible Other Construction Methods.** As shown in Figure 2-21, there is one additional segment evaluated for cut-and-cover construction in the Draft SEIS/EIR (besides the segment at the widened throat structure discussed above) that could be constructed using other construction methods - SEM or SEM with tunnel boring machines. The SEM technique is already proposed for the mined tunnel segment, as shown on Figure 2-2, and would excavate the tunnel from beneath the street surface. The additional segment where the SEM or SEM with tunnel boring machines method could be used extends approximately 1,200

feet along Townsend Street, between the underground Fourth and Townsend Street Station and Clarence Place. As a result, the surface disruption to circulation and access, the number of complete lane closures, and the loss of on-street parking that are identified in the 2004 FEIS/EIR due to cut-and-cover construction would be reduced. Similar to the prior discussion of the widened throat structure, the construction-related traffic impacts along Townsend Street would continue to be not adverse/less than significant with mitigation measures adopted as part of the 2004 FEIS/EIR and incorporated as part of the proposed project. However, given the length of this segment and the potential to reduce surface disruption along Townsend Street and particularly at the Townsend Street intersections with Third and Fourth Streets, the SEM and/or SEM with tunnel boring machine methods would further reduce the impacts previously described in the 2004 FEIS/EIR and the Draft SEIS/EIR.

Reduction of the temporary circulation impacts that would affect vehicles, pedestrians, and bicyclists would further support the City's goals to lessen conflicts and hazards for pedestrians and bicyclists and enable improvements envisioned by Muni Forward, the Better Streets Plan, the Bicycle Plan, and street enhancements along Second Street and Townsend Street to progress. In addition, use of SEM or SEM with tunnel boring machines through the intersection of Fourth and Townsend Streets would lessen impacts on the Muni Central Subway that traverses this intersection at grade, because these other construction methods would excavate and construct the DTX tunnel below the street level and avoid interference with the at-grade Central Subway light rail service. With the cut-and-cover construction method, DTX construction would need to provide temporary support for the Muni light rail tracks which would likely result in service delays and interruptions.

The 2004 FEIS/EIR identified approximately seven driveways between the underground Fourth and Townsend Street Station and Clarence Place that would be affected by cut-and-cover construction. The number of potentially affected driveways has since increased, because the south side of Townsend Street that had been undeveloped at the time of that analysis is now developed with retail businesses and offices. Loss of property access was acknowledged as a temporary construction impact that could be reduced by prompt construction of roadway decks and requirements to coordinate with property owners, businesses, and residents to minimize the short-term access impacts. Use of the other construction methods (SEM or SEM with tunnel boring machines) would further reduce potential impacts at shipping/receiving driveways, parking lot entrances/exits, loading docks, and on-street parking.

Unlike the cut-and-cover construction technique, these other construction methods would require compensation grouting that would occur from pits excavated from the street surface to below grade, approximately every 300 feet along Townsend Street. The pits would be excavated at parking spaces, or in lanes off Townsend Street and thus would not affect travel along Townsend Street, could be decked over after excavation to restore use of the parking space, and would be considerably less disruptive than cut-and-cover construction, which would affect travel and parking lanes until the street could be decked. The overall number of truck trips would be reduced because removal of excavated soils would be less with this mining technique, but the need to deliver materials such as concrete liners for the tunnel and for the set up and equipment required to support the tunnel boring machines, if also used, would partially offset this reduction in truck trips. Materials and equipment would be delivered to and stored at the Caltrain railyard and in the Fourth and Townsend Station excavation, increasing the transportation impacts in these locations. The construction duration using SEM/SEM with tunnel boring machines would be about three months less overall, compared to cut-and-cover construction. As a result, this construction method could reduce the intensity and duration of potential circulation impacts associated with cut-and-cover construction along the entire segment, and would not result in new or substantially

more severe adverse/significant impacts that cannot be mitigated by the mitigation measures approved in the 2004 FEIS/EIR and incorporated into the proposed project.

In the segment already evaluated for mining (between Townsend Street/Clarence Place and Second/Clementina Streets), surface street disruption was considered to be not adverse/less than significant because the construction would occur under Townsend and Second Streets. The use of tunnel boring machines in this segment as well would not alter these effects. As described above, there would be additional construction-related traffic where the tunnel boring machines enter and exit the tunnel, but these entry/exit points are already identified in the 2004 FEIS/EIR as the primary construction staging sites, where greater construction activity was already anticipated and evaluated. The effects on vehicular, pedestrian, and bicycle circulation would be mitigated by measures already approved in the 2004 FEIS/EIR and incorporated into the proposed project. The primary rationale for considering the use of tunnel boring machines with SEM in this segment is that the construction duration would be reduced by a few months, thereby resulting in a shorter period of disturbance.

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. Key developments used in the cumulative traffic conditions include the Transit Center District Plan; the Central SoMa Area Plan; the Mission Bay South Redevelopment Plan and the UCSF Long Range Development Plan for Mission Bay; SFMTA's Transit Effectiveness Project/Muni Forward; Caltrain electrification; and high-speed rail service. The future Cumulative Conditions also include the DTX because it has been approved and would be constructed by 2040.

2040 Cumulative Conditions without the Proposed Project

Previous and Current Cumulative Analyses Relevant to the Study Area

The following studies provide an overview to cumulative conditions in the project study area and account for changes over time, new information, and ongoing updates to the travel demand forecasting model used for projects in the City and County of San Francisco.

TCDP EIR – 2030 Cumulative Conditions. Although the 2010 FRA Reevaluation included the draft Transit Center District Plan (TCDP), that plan continued to evolve and was approved in 2012. The Transportation Impact Study (TIS) for the plan was completed in 2011 and provides the most current cumulative context for the Transit Center area of the Transbay Program. The 2030 Baseline Conditions evaluated in the TIS included the following projects in the transportation network that are relevant to the proposed project assessed in this SEIS/EIR: the Transit Effectiveness Project, the Central Subway, Caltrain electrification, and the Transit Center. Impacts were defined based on a comparison of No Project conditions in 2030 and Project conditions in 2030. A separate cumulative model run was not undertaken, because the 2030 forecasts developed by the City included growth in the remainder of the City, as well as the rest of the Bay Area.

The EIR concluded that the TCDP, and the Transit Tower that was part of the proposed project analyzed in the TCDP EIR, would adversely affect local intersection operations; cause a substantial increase in transit demand; create hazardous conditions for bicyclists and pedestrians; and result in a loading demand that could not be accommodated within on-site or on-street loading areas. Cumulatively, the TCDP in combination with other reasonably foreseeable probable future projects would contribute to congested

conditions at freeway on-ramps. The impacts result from the development and street modifications included in the TCDP. Traffic and pedestrian volumes and conditions associated with the Transbay Program such as the Transit Center and the DTX did not change from the prior 2010 FRA Reevaluation.

The traffic analysis of the TCDP EIR shows that the intersections operating at unacceptable LOS E or F conditions in the PM peak hour are primarily those leading to freeway on-ramps (First Street intersections from Market to Harrison Street; Harrison Street intersections at Main, First, Second, Essex, and Fourth Streets; Bryant Street at Second, Fourth, and Fifth Streets; and New Montgomery at Howard Streets). Intersections that were studied for changes in the AM peak hour were reported to operate at an acceptable LOS.

The TIS showed that background development growth and specific development projects in the plan area would increase pedestrian traffic. Because of the high concentration of jobs and transit service in the plan area, there is generally a high level of pedestrian activity throughout the day, with peaks occurring in the morning and afternoon commute periods and the noon hour. The TIS analysis expanded the number of study intersections, adding New Montgomery and Mission Streets, New Montgomery and Howard Streets, and Fremont/Market/Front Streets. The TCDP, which is part of the No Action Alternative in this SEIS/EIR, also includes improvements to the streets, sidewalks, and open spaces as identified in the "Public Realm" component. Despite these improvements, there would be a significant impact (LOS E or LOS F) at the following crosswalks in 2030 (the TCDP would also have a significant contribution to cumulative conditions at the intersections that are italicized): *New Montgomery/Mission*; Second/Mission; Second/Howard; *Fremont/Mission*; *First/Mission*; and *Beale/Howard*. Mitigation measures identified and adopted as part of the TCDP include additional sidewalk widenings, and bulb-outs, crosswalk widenings. With these mitigation measures, crosswalks in the project area would operate acceptably except at Second/Mission and Beale/Howard. Future impacts to study sidewalks and street corners could be mitigated to less than significant.

PCEP EIR – 2040 Cumulative Conditions. The Peninsula Corridor Electrification Project EIR (PCEP EIR, Peninsula Corridor Joint Powers Board 2015) examined the entire Caltrain corridor, including the area around the northern terminus station at Fourth and King Streets. As a result, this EIR provides relevant and current context for cumulative conditions around the southern portion of the proposed project. The cumulative horizon was year 2035 and relevant projects included HSR, DTX, Caltrain electrification and installation of a new advanced signal system, Central Subway 1.7-mile extension of Muni's T Line from the Fourth and King Street Station to Chinatown, and the Muni Forward improvement to the 22 Fillmore along 16th Street. The PCEP EIR relied on the Santa Clara Valley Transportation Authority, which similar to the SFCTA Model, is based on regional growth forecasts by the Association of Bay Area Governments. The PCEP EIR evaluated five intersections relevant to the proposed project. These intersections and the LOS are noted below in Table 3.2-8.

The PCEP EIR stated that the current high level of pedestrian activity in the vicinity of the Fourth and King Street Station is expected to continue into the future. The EIR forecasted that walking would be one of the dominant modes of access to the station in 2040; almost 40 percent of the access mode in the AM peak would be walking and more than 75 percent of the egress mode in the AM peak would be by walking. According to the PCEP EIR, at the Fourth and King Street Station, due to increased Caltrain ridership in combination with increased transit ridership on connecting services including the Central

Table 3.2-8
2040 Cumulative Intersection Conditions with the PCEP in the Vicinity of the Caltrain Railyard

Intersection	Peak Hour	Delay	LOS
Fourth and King	AM	>120	F
	PM	>120	F
Fourth and Townsend	AM	>120	F
	PM	>120	F
Mission Bay and Seventh	AM	16.6	B
	PM	17.0	B
Seventh and 16th	AM	>120	F
	PM	>120	F
16th and Owens	AM	10.6	B
	PM	55.8	E

Source: Peninsula Corridor Joint Powers Board 2015 (Table 4-17)

Subway and the proposed Embarcadero Streetcar extension, as well as general growth in the Fourth and King Street Station vicinity, the capacity of some of the pedestrian facilities would be exceeded, resulting in congested walkways and crosswalks around the station and queuing to cross local streets (Peninsula Corridor Joint Powers Board 2015). The adopted mitigation requires a pedestrian access study that would lead to identification and implementation of surface improvements to pedestrian facilities that would enable peak hour pedestrian conditions with the Caltrain electrification to be equivalent or better than No Project conditions. Future improvements that could be considered to achieve the performance standard include:

- Widened curb waiting areas and added pedestrian bulb-outs where high levels of demand cannot be accommodated by existing facilities;
- Pedestrian scramble at Fourth and Townsend Streets;
- Signalization improvements for both Fourth and Townsend and Fourth and King intersections;
- Widened crosswalks to increase pedestrian volumes and improved pedestrian sidewalk widths on the immediate approaches to the intersections of Fourth and Townsend and Fourth and King; and/or
- Pedestrian safety countermeasures, such as pedestrian barriers and improved signage, to address safety issues.

As explained below in the discussion of Impact CU-TR-8, the DTX project would have the effect of reducing pedestrian volumes and improving pedestrian conditions around the Fourth and King Street Station.

Central SoMA Area Plan Draft EIR – 2040 Cumulative Conditions. The Draft EIR for the Central SoMa Area Plan was released in December 2016 and contains the most current information available regarding transportation conditions in an area bounded by Market, Second, King, and Sixth Streets. The planning efforts were initiated in early 2011 and a Draft Central Corridor Plan was published by the Planning Department in April 2013. Growth and transportation network modifications envisioned by that plan in 2040 were included in the SFCTA Model used for this SEIS/EIR. The current plan issued in August 2016 does not identify any major street network investments for Townsend Street, which borders the Caltrain railyards and is relevant for the proposed project. Because the City embraced and pioneered

the new metric for evaluating traffic impacts when it adopted new CEQA thresholds of significance in 2016 (i.e., use of vehicle miles traveled rather than the traditional Level of Service methodology), the Draft EIR does not report intersection levels of service, except for informational purposes.

Pedestrian conditions of relevance to the proposed project are described for the intersection of Fourth and Townsend Streets. As seen in Table 3.2-9, that intersection would operate unacceptably during the midday peak hour (LOS F along the west crosswalk) and during the PM peak hour (LOS E along the south crosswalk and LOS F along the west crosswalk). Even with mitigation to widen and restripe crosswalks (Mitigation Measure M-TR-4: Upgrade Central SoMa Area Crosswalks), the Draft EIR concluded that cumulative impacts at this intersection would remain significant and unavoidable. Sidewalks and corners were projected to operate acceptably in 2040 cumulative conditions. This analysis is consistent with the PCEP EIR findings mentioned earlier, which forecasted high level of pedestrian activity in 2040.

Table 3.2-9
PM Peak - 2040 Cumulative Conditions

Intersection	Location	No (Central SoMa Plan) Project		With (Central SoMa Plan) Project	
		Ped Vol	LOS	Ped Vol	LOS
Crosswalk					
Fourth/Townsend	North	806	B	1,574	C
	South	1,045	C	**2,040**	**E**
	East	775	B	1,512	C
	West	**2,087**	**F**	**4,072**	**F**
Sidewalk					
Fourth Street between Brannan and Townsend	West	1,295	C	2,528	D
	East	740	B	1,445	C
Pedestrian Corner					
Fourth/Townsend	Northwest	3,182	A	6,211	D
	Northeast	1,739	A	3,394	A
	Southwest	3,445	A	6,724	A
	Southeast	2,002	A	3,907	A

Bold indicates unacceptable LOS E or worse.
Source: City and County of San Francisco 2016

Intersection Operations

Intersections evaluated in this cumulative study are those relevant to the proposed project components.

Intersections. 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~~10.

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.

16th Street Crossing. The only at-grade crossing of a surface street by the proposed project would occur at 16th Street where a turnback track would be installed within the existing railroad right-of-way adjacent to the Caltrain mainline, along Seventh Street. As explained in the discussion of Impact TR-1 in Section 3.2, Transportation, existing conditions at this intersection currently are affected by the crossing

Table 3.2-9~~1~~0
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~~C	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**	**>~~8~~120.0 (N/A)**	**F**	**>~~8~~120.0 (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

gates that are lowered to allow Caltrain service to travel through the at-grade crossing safely. Future conditions at this intersection (#12 in Table 3.2-10) would be affected by passenger rail service along the mainline tracks, 16th Street changes associated with the Muni Forward transit priority project for the 22 Fillmore, and background development associated with the UCSF Long Range Development Plan for Mission Bay and the Warriors Arena project with or without the proposed project.

As described in the PCEP EIR (Peninsula Corridor Joint Powers Board 2015), the projected number of Caltrain trains would increase from 92 per day to 114 per day. The potential number of high-speed trains could be 106 trains per day. Therefore, the gates at the 16th Street crossing would close approximately 220 times per day for Caltrain and HSR trains operating along the existing mainline (next to the turnback track) in 2040. Many of these crossings would occur in the AM and PM peak hours. In addition to the increased gate downtime to accommodate passenger rail, plans to improve travel speeds and service reliability for the 22 Fillmore involve converting automobile lanes along 16th Street to transit-only lanes.

These two changes to the transportation network have the cumulative effect of reducing the automobile capacity of 16th Street and the level of service at the 16th/Seventh/Mississippi Streets intersection. The development of the 60-acre UCSF Mission Bay campus plans 3.18 million gross square feet through 2035, and the 11-acre Warriors Arena project plans an additional nearly 2 million square feet of development, which includes an arena with up to 225 events per year. As a result, four EIRs completed while this SEIS/EIR has been in preparation found that the 16th/Seventh/Mississippi Streets intersection would operate at LOS F in 2035 or 2040 (SFMTA 2014, UCSF 2014, Peninsula Corridor Joint Powers Board 2015 [Appendix D), SF OCII 2015). It is in part because of these delays along 16th Street, the increased gate downtime required by the planned increase in passenger rail service, the developing Mission Bay campus, and the opportunities to knit together the surrounding neighborhoods and create open space that the City's Rail Alignment and Benefits Study (RAB Study) is evaluating the possibility of grade separating this existing at-grade crossing.

Pedestrian Operations

The proposed project has the potential to substantially alter pedestrian volumes and circulation in the vicinity of the underground pedestrian connector, under Beale Street between the Transit Center and Market Street. The future 2040 Cumulative Conditions around this proposed project component was derived b~~B~~y 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 3.2-11~~12~~ and Table 3.2-12~~13~~.

As shown in Table 3.2-11~~12~~, 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.

Table 3.2-11~~2~~
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

As shown in Table 3.2-12~~13~~, 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 3.2-12~~13~~
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.

Traffic. 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~~,~~ and 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. Furthermore, the proposed turnback track would not be used during the AM/PM peak hours, and would not increase gate downtime during these critical travel periods. Although not anticipated, if Caltrain does require use of the turnback track in the AM/PM peak hours because of future changes in operations, New-MM-TR-1.1 would reduce the effects of the proposed project to less than significant and the cumulative contribution to less than cumulatively considerable under CEQA. 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.

16th Street Crossing. Use of the turnback track would result in 24 additional gate closures per day, an increase of 11 percent over the estimated 220 closures that would be needed for Caltrain and high-speed rail service. However, Caltrain has committed that none of the turnback track crossings would be during either the AM or PM peak hour. Use of the turnback track would be 70 seconds per occurrence, or 28 minutes throughout an entire day during the off-peak hours. Of these crossings, 8 would occur before 6:35 a.m., 4 between 9:15 a.m. and 10:40 a.m., 4 between 3:10 p.m. and 4:35 p.m., and 8 after 7:15 p.m. The 70 seconds of delay would be comparable to typical automobile delay during one signal cycle at a signalized intersection with high volumes and multiple turning movements.

While use of the turnback track would contribute to delays at its crossing of 16th Street, further information on the significance of this impact on future cumulative conditions is provided in a 2013 Caltrain study of gate downtime at several crossings between San Francisco and San Jose, including the 16th Street crossing. The results, which are shown in Table 3.2-13, below, provide perspective on the amount of delay introduced by use of the turnback track compared to delay by existing and future Caltrain service. For the study's horizon year of 2035, the study assumed the 6+4 train schedule defined in a companion study, called the Caltrain/HSR Blended Operations Analysis (Peninsula Corridor Joint Powers Board 2012). This schedule assumes 6 Caltrain trains and 4 HSR trains would operate in each direction in the peak hour. In the AM peak hour, the gates would be down for 12 minutes in the existing condition and 20 minutes in the future (2035) condition. In the PM peak hour, existing downtime would be 7 minutes and 17 minutes in the future. None of the turnback track crossings for the proposed project would occur during the AM and PM peak hours, and the gate downtime would average about 4 minutes per off-peak

Table 3.2-13
Gate Downtime Simulation Results Without the Proposed Project

	Existing (2013 train schedule)	2035 (6+4 train schedule)
AM Peak Hour		
Gate Down Events (events per hour)	12	20
Downtime Per Event (seconds)	58	59
Total Downtime Per Hour (minutes)	12	20
PM Peak Hour		
Gate Down Events (events per hour)	7	17
Downtime Per Event (seconds)	75	62
Total Downtime Per Hour (minutes)	8.5	18
Source: Peninsula Corridor Joint Powers Board 2013		

hour. Two-thirds of the turnback crossings occur either before 6:35 AM or after 7:15 PM when traffic volumes are much lighter.

Table 3.2-8 and the EIRs for projects in the vicinity of the 16th Street crossing that are cited demonstrate that the 16th Street at-grade crossing with the railroad tracks and the adjacent intersection of 16th/Seventh/Mississippi Streets would operate at unacceptable levels of delay during the AM/PM peak hours. This crossing would be significantly affected under future 2040 cumulative conditions without the proposed project. As described above, however, the proposed use of the turnback track would not contribute to the delays and congestion during the critical commute periods. As a result, the proposed project would have no cumulative effect on future AM/PM peak hours. The proposed project would contribute to delays at this crossing over the course of an entire day excluding the peak hours, but the 24 crossings per day, totaling 28 minutes of downtime, would not be cumulatively considerable given the planned schedules for Caltrain and HSR service. Therefore, the proposed project's contribution to the cumulative impact on street crossings and at-grade intersections would be not adverse/less than significant.

Pedestrians. ~~Similarly,~~ Tables 3.2-11~~12~~ and 3.2-12~~13~~ 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. T~~herefore,~~ Rather, the proposed project would reduce the significant cumulative impact conclusion in the 2004 FEIS/EIR.

The most current available pedestrian analysis in this area is the Central SoMa Area Plan Draft EIR. According to this EIR (City of San Francisco 2016), the increase in pedestrian volumes from Existing Conditions (without the plan) to the 2040 Cumulative Condition (without the plan) is 568 pedestrians over a 24-year period. Within the Central SoMa Area Plan, pedestrian volumes are projected to increase by nearly 2,000 pedestrians. This analysis demonstrates the significant contribution to future pedestrian conditions of the changed land uses and increased development intensities in the proposed plan. The Draft EIR concludes that the plan would have a significant and unavoidable impact at the Fourth and Townsend

Streets intersection, even with the proposed mitigation involving widening the sidewalk and restriping the crosswalks.

The approved DTX would not contribute substantially to these unacceptable pedestrian conditions based on past Caltrain studies showing a reduction in passenger (and thereby pedestrian) use of the Fourth and King Street Station. The PCEP EIR discussed the expected lower number of boardings with DTX compared to boardings without DTX in 2040 (15,230 and 16,560, respectively). The 2008 Caltrain DTX and Transbay Ridership Analysis by Cambridge Systematics, Inc. also forecasted a reduction in the number of passengers using the Fourth and King Caltrain Station in 2030 with the DTX compared to without DTX (between 16,300 to 20,900 with DTX, based on the alternatives studied, compared to 30,900 without DTX). This reduction in Caltrain boardings (and corresponding alightings) is expected because passengers with destinations in downtown San Francisco, the financial district, or the Transit Center area would no longer alight at the Fourth and King Caltrain Station. Instead of alighting at this station and walking to their destinations or to connecting transit services, these passengers would continue their ride and alight at the Transit Center. Similarly, passengers from downtown San Francisco, the financial district, and the Transit Center area departing for Caltrain destinations along the Peninsula and South Bay would board Caltrain at the Transit Center, rather than from the Fourth and King Caltrain Station. The reduction in boardings and alightings at this station would result in lesser pedestrian volumes and future 2040 cumulative impacts than without the DTX. The realignment of the Fourth and Townsend Station as part of the proposed project would not alter this less-than-significant cumulative impact.

In conclusion, while the pedestrian impact under the 2040 Cumulative With Project (including Central SoMa Plan) scenario would be significant and unavoidable with mitigation, according to the Central SoMa Area Plan Draft EIR, the proposed project's contribution to the cumulative impact would not be cumulatively considerable under CEQA. Based on the discussion above, despite changed conditions due to the Central SoMa Area Plan, the DTX, as it is proposed to be refined by the realigned Fourth and Townsend Station, would have the beneficial effect of reducing future pedestrian volumes at intersections and sidewalks around the Fourth and King Caltrain Station, by shifting Caltrain passengers from this location to the Transit Center. Therefore, the cumulative impacts on pedestrian circulation and safety with the proposed project would be not adverse/less than significant in this portion of the proposed project study area.

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, renamed as the Rail Alignment and Benefits 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. According to the City, the recommendations from the RAB study, which were released in draft form in May 2018, would not be expected to affect the construction schedules of the Transit Center or the DTX, and have reaffirmed the DTX alignment previously approved and modified as part of the proposed project.

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 and New-MM-TR-3.1, 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. Although not anticipated, t~~T~~he proposed project analyzed in this SEIS/EIR would have a potentially significant impact on intersection operations along 16th Street at Seventh/Mississippi Street, the Caltrain ~~/~~turnback track~~s~~, and Owens Street, if Caltrain modified its current operational plans and needed to use the turnback track during the AM/PM peak hours and would result in 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~~3.1, 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~~3.1, 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. The other construction methods described and evaluated in this Final SEIS/EIR would further reduce construction-related circulation, access, and parking impacts. 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.

2.8 UPDATED SECTION 3.3.2, LAND USE AND PLANNING, WIND, AND SHADOW AFFECTED ENVIRONMENT

The "Affected Environment" discussion in Section 3.2, Land Use and Planning, Wind, and Shadow, is reproduced below and is amended to address comments on the Draft SEIS/EIR.

3.3.2 Land Use and Planning, Wind, and Shadow Affected Environment

Land Use Study Area

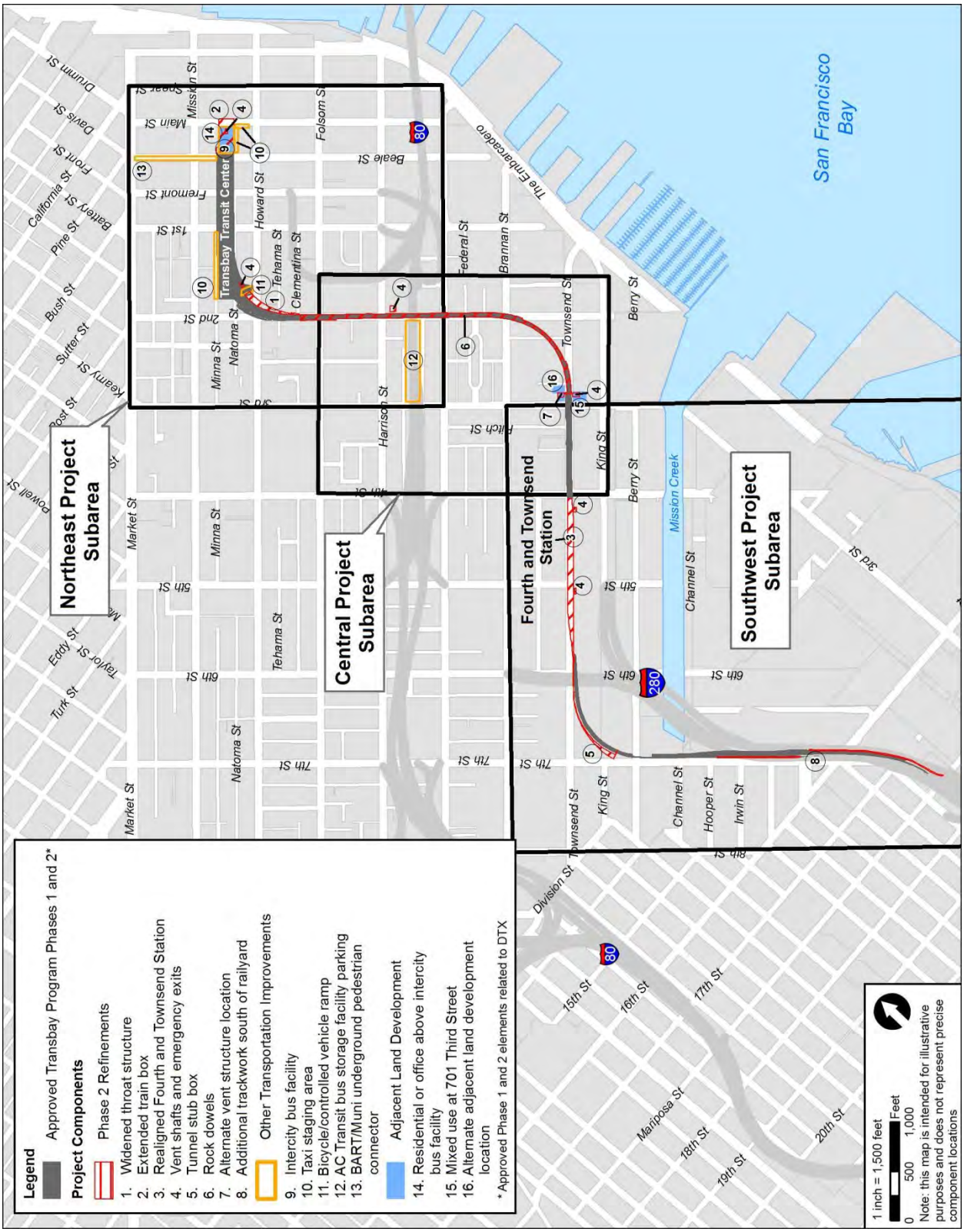
The land use study area (study area) encompasses properties that would be used for the proposed project and those properties immediately adjacent to the proposed project components that could be affected. The geographic boundaries of the study area and the location of each proposed project component 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 <u>located</u> ~~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

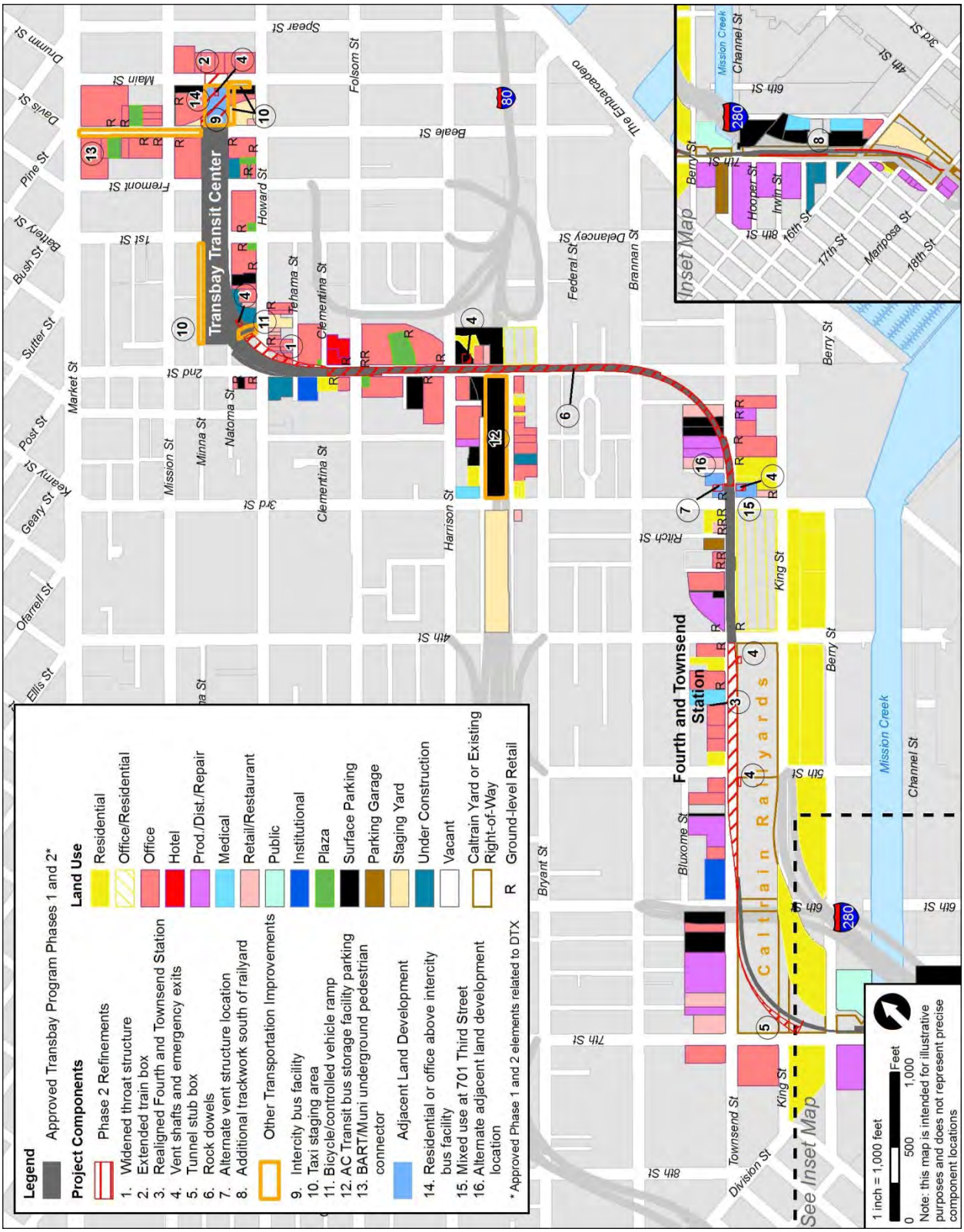
The study area is characterized by a mix of land uses, and generally includes office; retail; mixed-use; residential; live/work; light industrial; production, distribution, and repair (PDR)[13] warehousing/ distribution; and institutional; as well as surface parking lots, parking garages, and transportation-related 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 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

[13] 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

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

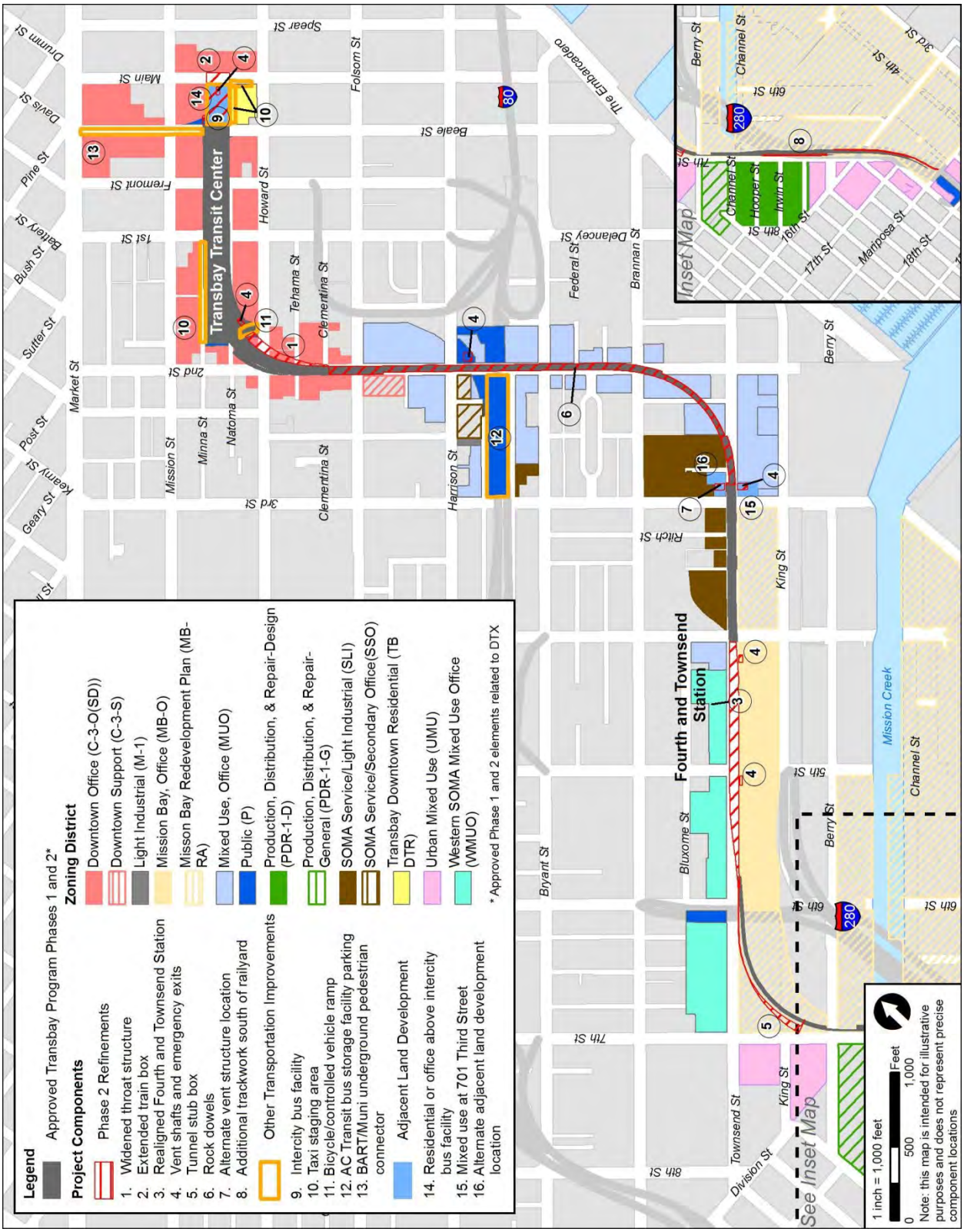
The northeast project subarea is generally bounded by Market Street to the north, Spear Street to the east, Third Street to the west, and Folsom Street to the south, and contains the project components in the vicinity of the future Transit Center. This subarea is located within the southern Financial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

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.



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

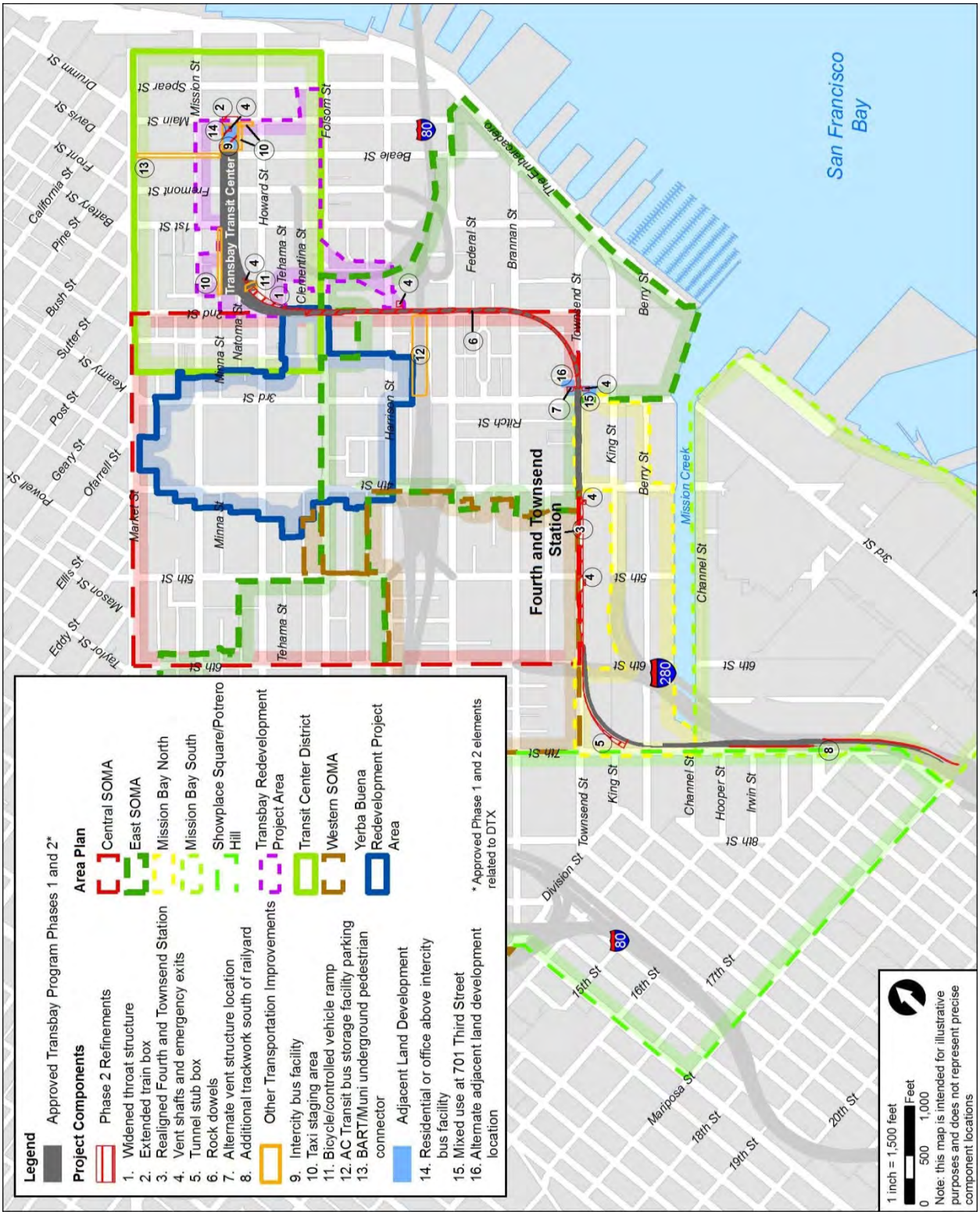
Project Component	Map Key	At or Above Ground[1]	Existing Land Use at Project Site	Adjacent Existing Land Uses	Zoning District
Widened throat structure[1]	1	No	Office (at 235 Second and 589 Howard Streets), surface parking lot	Office, retail, parking, Transit Center site	Downtown Office (Special Development)
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.

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.

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.



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

Figure 3.3-4 Area Plans

The ~~originally proposed~~ 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 v~~Vent structure at 699 Third Street/180 Townsend Street	4	Yes	Office and retail	Residential, office, retail	~~SOMA Service-Light Industrial~~Mixed Use Office
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.[14] The East SoMa Plan includes policies to retain space for existing businesses and residential uses while allowing space for new development, especially affordable housing.[15]

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, as amended in 2016) envision retaining space for existing businesses and residential uses while

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

[15] 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).

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.

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

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), Mission Bay

South Redevelopment Plan (San Francisco Redevelopment Agency 2013), 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. As part of the Mission Bay South Redevelopment Plan, the area along the additional trackwork south of the railyard is designated as open space, public facilities (which includes railroad tracks and related facilities), and commercial industrial uses (mixed use including neighborhood-serving retail, manufacturing, office use, and animal care facilities). The Mission Bay North and South Redevelopment Plans, along with the University of California San Francisco Long Range Development Plan (UCSF LRDP) that was approved on November 20, 2014, have resulted in the transformation of the Mission Bay area into a new community, consisting of residential development, open space, research buildings, and health care facilities. Approximately 1.46 million gsf of new space at the Mission Bay campus is proposed under the UCSF LRDP (UCSF 2014).

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. The southwestern portion of the Central SoMa Plan area overlaps the Western SoMa Plan area. The Central SoMa Plan is consistent with many of the core policies and proposals of the Western SoMa Plan,

but proposes changes to support more transit-oriented growth west of Fourth Street (City of San Francisco 2013a).

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.

An updated draft plan was released in 2016 (City of San Francisco 2016) and envisions over 8,000 more housing units and about 30,000 new jobs. The Draft EIR on the plan was issued on December 14, 2016. The Final EIR will need to be certified before the Plan can be adopted by the City. The Planning Commission voted to certify the Final EIR and approved the Plan in May 2018 (City of San Francisco 2018) and final approval of the Plan is currently pending before the Board of Supervisors.

Western SoMa Community Plan

The Western SoMa Community Plan was adopted by the Board of Supervisors on March 19, 2013 (City of San Francisco 2017). The plan is based on a set of planning principles developed by the Western SoMa Citizens Planning Task Force and includes objectives and policies related to land use, neighborhood economy, housing, transportation, urban design, preservation, open space, public realm improvements, arts and entertainment, community facilities, and safety. The land use objectives and policies focus on building on existing mixed-use character, encouraging preservation of existing and appropriate new land uses, improving indoor air quality, minimizing noise impacts, and continuing to evaluate land uses near major transit infrastructure (City of San Francisco 2013b). Subsequent to the adoption of the plan, a portion of the Western SoMa plan area was included within the Central SoMa Plan area, for which a draft plan was released in 2013 and approved by the Planning Commission in May 2018.

Mission Bay North and South Redevelopment Plans

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. Both Redevelopment Plans conform to the Central Waterfront Plan, which outlines broad land use objectives and policies for the Central Waterfront, of which Mission Bay North and South are a part. The Redevelopment Plans describe land uses within the plan area, general controls and limitations on development/uses (e.g., building height, number of dwelling units, fees, etc.), and proposed redevelopment actions.

The Mission Bay North Redevelopment Plan was approved by the San Francisco Board of Supervisors on October 26, 1998. This Redevelopment Plan guides development in the Mission Bay North area, which is located between King Street and Mission Creek from Third Street to Seventh Street. 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.

The Mission Bay South Redevelopment Plan was approved by the San Francisco Board of Supervisors on November 2, 1998 and an amendment was approved on July 9, 2013. This Redevelopment Plan guides development within the Mission Bay South area, which is located south of Mission Creek between Seventh Street and the San Francisco Bay south to Mariposa Street. The land use categories in Mission Bay South are residential, hotel, commercial/industrial, retail, open space, public facility, and University of California San Francisco uses. The Redevelopment Plan incorporates uses defined in the UCSF LRDP, which includes the UCSF Mission Bay campus providing housing, open space, research uses, and health care facilities.

University of California San Francisco Long Range Development Plan

The University of California San Francisco Long Range Development Plan (UCSF LRDP) guides future campus growth and development through 2035 (UCSF 2014). The 60.2-acre UCSF Mission Bay campus is located within the Mission Bay South Redevelopment area. The north and south portions of the campus are separated by 16th Street. Approximately 1.46 million gross square feet (gsf) of new space at the Mission Bay campus is proposed under the LRDP, all of which would be located on the North Campus, and includes 458,500 gsf of existing approved development plus 991,800 gsf of new development. Development proposed for the North Campus would be located east of Owens Street. Uses within the North Campus include research, housing, open space, support, and parking. The UCSF Medical Center at Mission Bay Phase 1 opened in February 2015 on the South Campus and includes a children's hospital, women's hospital, cancer hospital, and outpatient cancer building. Phase 2 of the Medical Center likely will not be constructed until after 2035 and will be constructed across the Fourth Street Public Plaza.

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.

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2.9 UPDATED SECTION 3.4.3, SOCIOECONOMICS, POPULATION, AND HOUSING ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.4.3, Socioeconomics, Population, and Housing Environmental Consequences and Mitigation Measures, is reproduced below and is amended to include updated information regarding displacement at 235 Second Street and to assess other construction methods.

3.4.3 Socioeconomics, Population, and Housing Environmental Consequences and Mitigation Measures in the FEIS

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;
- 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~~ D of this Final 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~~ D of this Final 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~~ D of this Final 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.

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.[a]	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

Note:
a – This site is no longer available. A full-service hotel at this location is scheduled to open in late 2018.
Source: City and County of San Francisco 2014a

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~~ six 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 c~~w~~ould be temporarily displaced during construction: 62 employees at 589 Howard Street, and 52 employees from the portion of 235 Second Street that c~~w~~ould be affected. It is possible that many of the employees at 235 Second Street could be relocated within the same building.

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.

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.[c] (3794/006)	~~1~~	~~13,750~~	~~1,716~~	~~0~~	~~1~~	~~0~~	~~1~~	~~50~~
~~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~~ 6**	**~~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 could 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.

[c] This site is no longer available. A full-service hotel at this location is scheduled to open in late 2018.

Sources: ABAG 1991; NAIOP 2012; McDonald's Corporation 2013; National Parking Association 2011; compiled by Seifel Consulting in 2014; adapted by AECOM in 2014

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 333 ~~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 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

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[d]	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 Lot	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 c~~w~~ould 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.~~ This site is no longer available. A full-service hotel at this location is scheduled to open in late 2018.

[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

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 northwest corner of the building would be underpinned for construction of the throat structure. It is not anticipated that occupants would be displaced during construction; however, should it be determined that some of the employees require relocation during construction,~~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.~~ ~~T~~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 c~~w~~ould affect up to 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 originally proposed vent structure at 701 Third Street would have replaced an existing fast food restaurant. Since the release of the Draft SEIS/EIR, this

site was sold and has been redeveloped with a hotel that is scheduled to open in late 2018. ~~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.[16]

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

[16] 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).

retail space in the project area.[17] 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. 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

[17] 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.

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 resources that have the potential to affect children include transportation, water quality and flood hazard, exposure to hazardous materials, noise and vibration, and air quality. However, the adverse impacts would not be predominately borne by children, or be suffered by children in a manner that would be appreciably more severe or greater in magnitude than would be suffered by the rest of the population. Also, effects to these resources would not be adverse with mitigation measures identified in this Chapter 3 of the SEIS/EIR. Therefore, 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.

Use of other construction methods (described in Section 2.4 of this Final SEIS/EIR), especially where cut-and-cover construction is proposed, would reduce construction-related socioeconomic effects, because tunnel construction would occur almost entirely underground. Specifically, the jacked box tunnel method at the Howard Street crossing of the widened throat structure and the SEM or SEM with tunnel boring machines method along 1,200 feet of Townsend Street, between Fourth Street and Clarence Place, would lessen the impacts to street-level disruption that could interfere with routine economic and social interactions, economic vitality, social cohesion, and circulation and access to businesses, residences, and community/recreational facilities, as described in Section 2.7 Transportation of this Final SEIS/EIR. These other construction methods would also shorten the duration of construction and would generally be less impactful since they require fewer truck trips to remove excavated soil materials. Construction-related effects, however, could be more intense at limited locations where additional activity for staging and deliveries for materials and equipment may be needed. These particular locations are already identified as staging areas/construction sites for the construction methods described in the Draft SEIS/EIR and projected to experience more intense construction-period effects than other locations along the alignment, as described in Section 2.7, Transportation; 2.10, Aesthetics; Section 2.15, Noise and Vibration; and Section 2.16, Air Quality. Overall, the other construction methods would lessen impacts on property access, loss of on-street parking, congestion, views and changes to the streetscape, noise, and dust – all of which affect the community's social and economic well being. Therefore, these other construction methods would further reduce the construction-related socioeconomic impacts, compared to the cut-and-cover construction method.

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.

2.10 UPDATED SECTION 3.5.3, VISUAL QUALITY/AESTHETICS ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.5.3, Visual Quality/Aesthetics Environmental Consequences and Mitigation Measures, is reproduced below and is amended to assess other construction methods.

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~~ D of this Final 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~~ D of this Final 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.

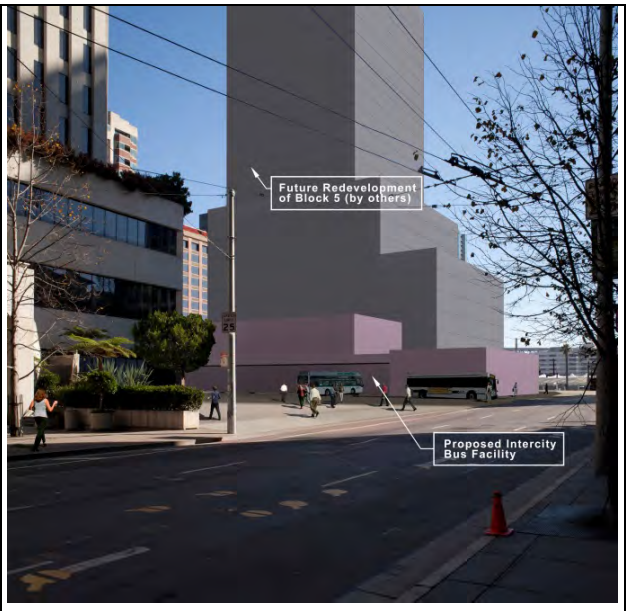
Impact VQ-1: The proposed project would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources. (No Adverse Effect/Less-than-Significant Impact)

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 originally proposed vent structure at 701 Third Street would have occupied ~~occupy~~ a portion of the site that currently contains a fast food restaurant (see Figure 3.5-8a). Since the release of the Draft SEIS/EIR, this site was sold and has been redeveloped with a hotel that is scheduled to open in late 2018. ~~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).~~

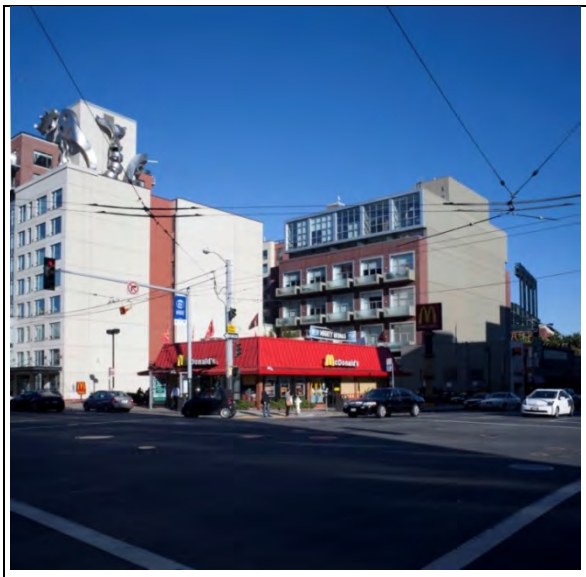
The ~~alternate~~ vent structure site at the northeast corner of Third and Townsend Streets would occupy a portion of the site that currently contains a liquor store and professional offices (see Figure 3.5-8c). The vent structure would occupy a footprint of approximately 4,000 square feet.

The proposed vent structure ~~at both sites~~ would not be visible from I-80 when traveling west; however, the visual simulation (Figure~~s 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.

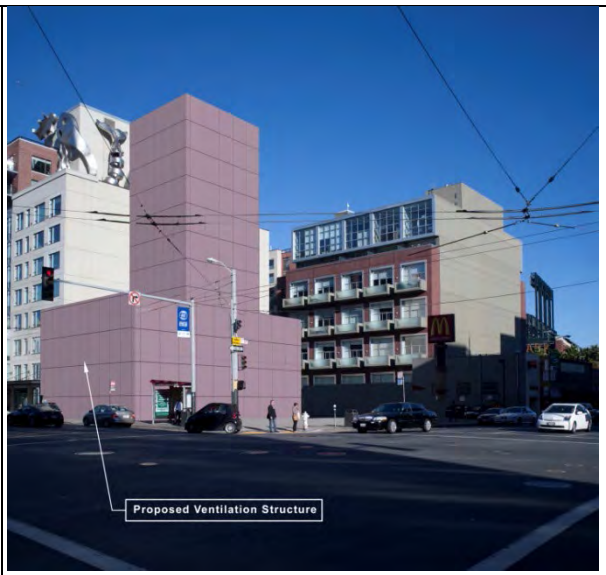
The v~~V~~ent structure~~s at either site~~ could alter scenic views of the San Francisco Bay looking south from Third and Townsend Streets. However, due to the relatively level topography of the area, views of the San Francisco Bay are already obstructed by the Third Street Bridge, and there is no other 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.

The proposed vent structure ~~sites are~~ is not visible from The Embarcadero, which is 1,300 feet away from the proposed project site~~s~~; however, portions of the site~~s~~ are visible from AT&T Park at King and Third Streets. The proposed vent structure~~s~~ would be constructed at the east end of the site~~s~~, out of view from King and Third Streets. AT&T Park would continue to be visible from vantage points in the vicinity of the site~~s~~. Therefore, the proposed vent structure~~s~~ would have a no adverse effect/less-than-significant impact on a scenic resource.

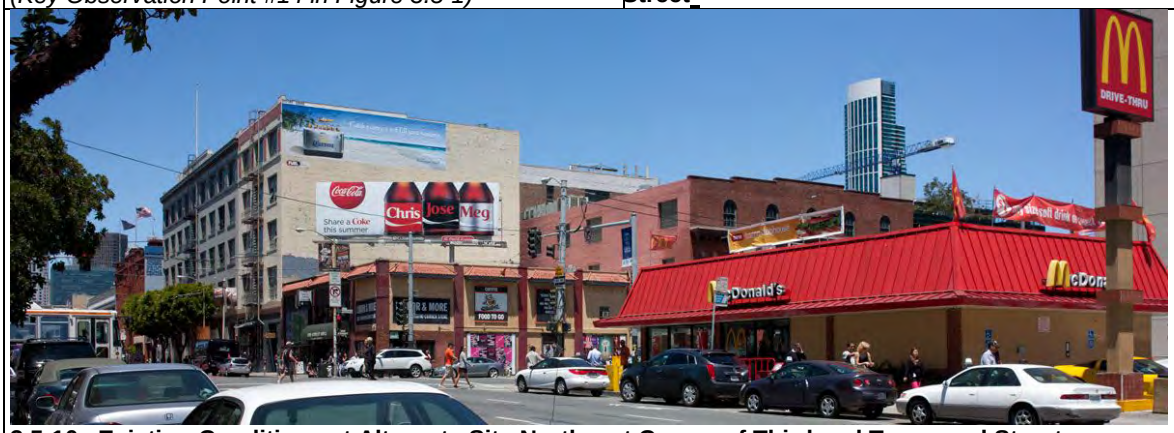
The vent structure~~s at 701 Third Street and the alternate site~~ would occupy a footprint~~s~~ of approximately ~~3,600 and~~ 4,000 square feet~~, respectively,~~ and the balance of ~~each~~ the site would be available for adjacent development of approximately 72,000 square feet of mixed uses. The 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 structure~~s~~ would offer a continuous building façade along the site's~~'~~ Third Street frontage~~s~~. Under NEPA, the adjacent development at the ~~701 Third Street and alternative~~ site would have no indirect adverse effect on a scenic vista.



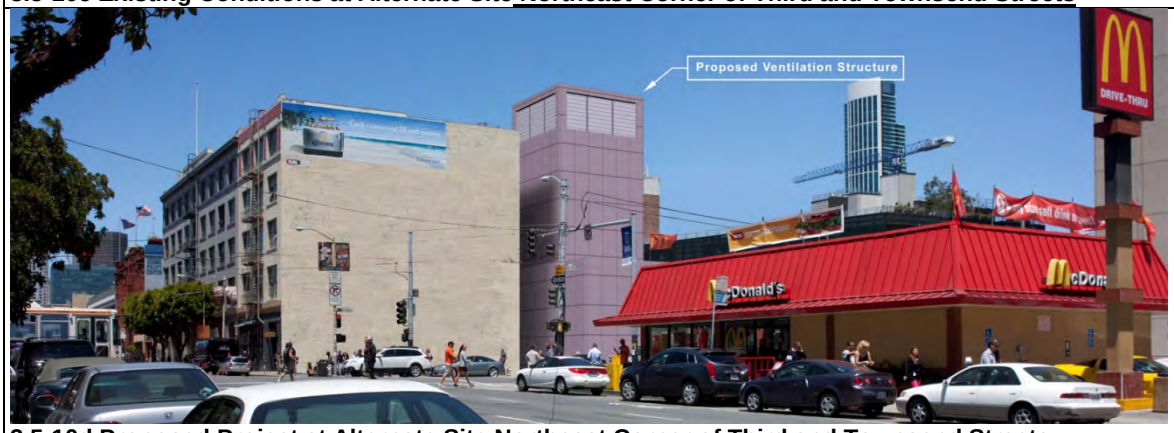
3.5-10a Existing Conditions at 701 Third Street
(Key Observation Point #14 in Figure 3.5-1)



3.5-10b <u>Originally</u> Proposed Project at 701 Third Street<u>*</u>



3.5-10c Existing Conditions at Alternate Site <u>Northeast Corner of Third and Townsend Streets</u>



3.5-10d Proposed Project at Alternate Site <u>Northeast Corner of Third and Townsend Streets</u>

Source: Created by Square One Productions 2014

<u>* This site is no longer available and the preferred site is at the northeast corner of Third and Townsend Streets.</u>

Figures 3.5-10a–10d Visual Simulation of Vent Structure at ~~701 Third Street and Alternate Site~~ <u>Third and Townsend Streets</u>

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 Third and Townsend Streets ~~701 Third Street or Alternate Site~~ (and adjacent land development). The originally proposed vent structure at 701 Third Street would have replaced a fast food restaurant and parking lot~~;~~, but this site is no longer available and has been redeveloped as a hotel. The preferred vent structure site at the northeast corner of the intersection would replace 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 originally proposed and at the now preferred 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 vent structure 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.

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.

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

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, there are two segments evaluated for cut-and-cover construction in the Draft SEIS/EIR that could be constructed using other construction methods – jacked box tunnel at the widened throat structure and SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place). Although the impacts associated with the construction methods evaluated in the Draft SEIS/EIR would be mitigated to not adverse/less than significant, these other construction methods could lessen the temporary impact construction activities have on the visual character of the area. At the widened throat structure and along Townsend Street, these other construction methods would limit staging areas and reduce street surface disruption as tunnel construction activities would occur almost entirely underground.

- The jacked box tunnel method would involve excavating and constructing the tunnel for a short segment at the Howard Street crossing – approximately 230 feet eastward along Howard Street and 80 feet across Howard Street. The further reduction in visual quality impacts, which would already be mitigated by measures adopted in the 2004 FEIS/EIR and incorporated into the proposed project, would be due to underground tunnel construction, which would reduce street surface disruption and the visual effects of the open excavation associated with cut-and-cover construction (namely, temporary changes to the appearance and function of the public realm, alterations to the streetscape, and the introduction of construction staging areas, equipment, materials, and barriers). Because this segment is short, the potential aesthetic and visual quality impacts under this construction method would be less than for the cut-and-cover construction technique but not substantially.

- SEM would also reduce the amount of street surface disruption and the visual effects of the open excavation along the 1,200-foot Townsend Street segment where this construction method could apply. As described in Section 2.4 of this Final SEIS/EIR, 15- to 20-foot diameter access pits

would be excavated from the surface approximately every 300 feet along Townsend Street in order to provide sites for the compensation grouting injections. These access pits and the equipment needed to support the compensation grouting, however, would be less visually disruptive and affect a smaller area than the staging areas and construction activity associated with cut-and-cover construction. As a result, potential aesthetic and visual quality impacts under this construction method would be not adverse/less than significant, and less than those previously described for the cut-and-cover construction technique along this segment.

- Use of tunnel boring machines with SEM would have negligible aesthetic and visual effects because tunnel construction would already take place underground where SEM could be used. As a result, potential aesthetic and visual quality impacts under this construction method would be not adverse/less than significant.

In summary, these other construction methods would not alter the not adverse/less-than-significant impact identified in the Draft SEIS/EIR. They have the potential of reducing temporary aesthetic and visual quality impacts compared to the construction methods evaluated in the Draft SEIS/EIR, however, 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 the planned construction method. The determination of which construction method is appropriate for the proposed project will be made following further design and evaluation of the construction methods' cost and schedule implications, constructability, and environmental and public policy considerations.

~~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 Third and Townsend Streets ~~701 Third Street or Alternate Site~~ (and adjacent land development). The proposed vent structure height~~s at 701 Third Street or the alternate site~~ would be consistent with City zoning. The~~se~~ structure~~s~~ 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~~ at Third and Townsend Streets 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.

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, construction methods other than cut-and-cover construction could be used. Specifically, the jacked box tunnel at the widened throat structure and SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place) could be used. Because these other construction methods would occur almost entirely underground along the length of the segments where they may apply, they could reduce the need for construction lighting and thereby further reduce the light and glare impact described in the 2004 FEIS/EIR. Mitigation Measure VA 1, which was adopted as part of the 2004 FEIS/EIR, would apply to the proposed project and minimize potential light and glare impacts of the planned construction method.

~~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.

2.11 UPDATED SECTION 3.6, HISTORIC AND CULTURAL RESOURCES

Section 3.6, Historic and Cultural Resources, is reproduced below and is amended to address comments on the Draft SEIS/EIR and consultations with the State Historic Preservation Officer.

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, ~~T~~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. The MOA contains stipulations and specific guidance covering, but not limited to, ongoing consultation, preparation of treatment plans, and protective measures to avoid or minimize damage to historical resources. 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. A second amendment was executed in August 2016 to more fully describe the annual report from the TJPA on compliance with the MOA stipulations; include additional procedures for discovery of cultural deposits during ground-disturbing construction activities; and adjust the timeline for fulfilling the terms of the MOA. The proposed project consists largely of refinements to the approved Transbay Program. Consequently, FTA ~~is~~ has continued its consultations~~g~~ with the SHPO in accordance with Section 106.

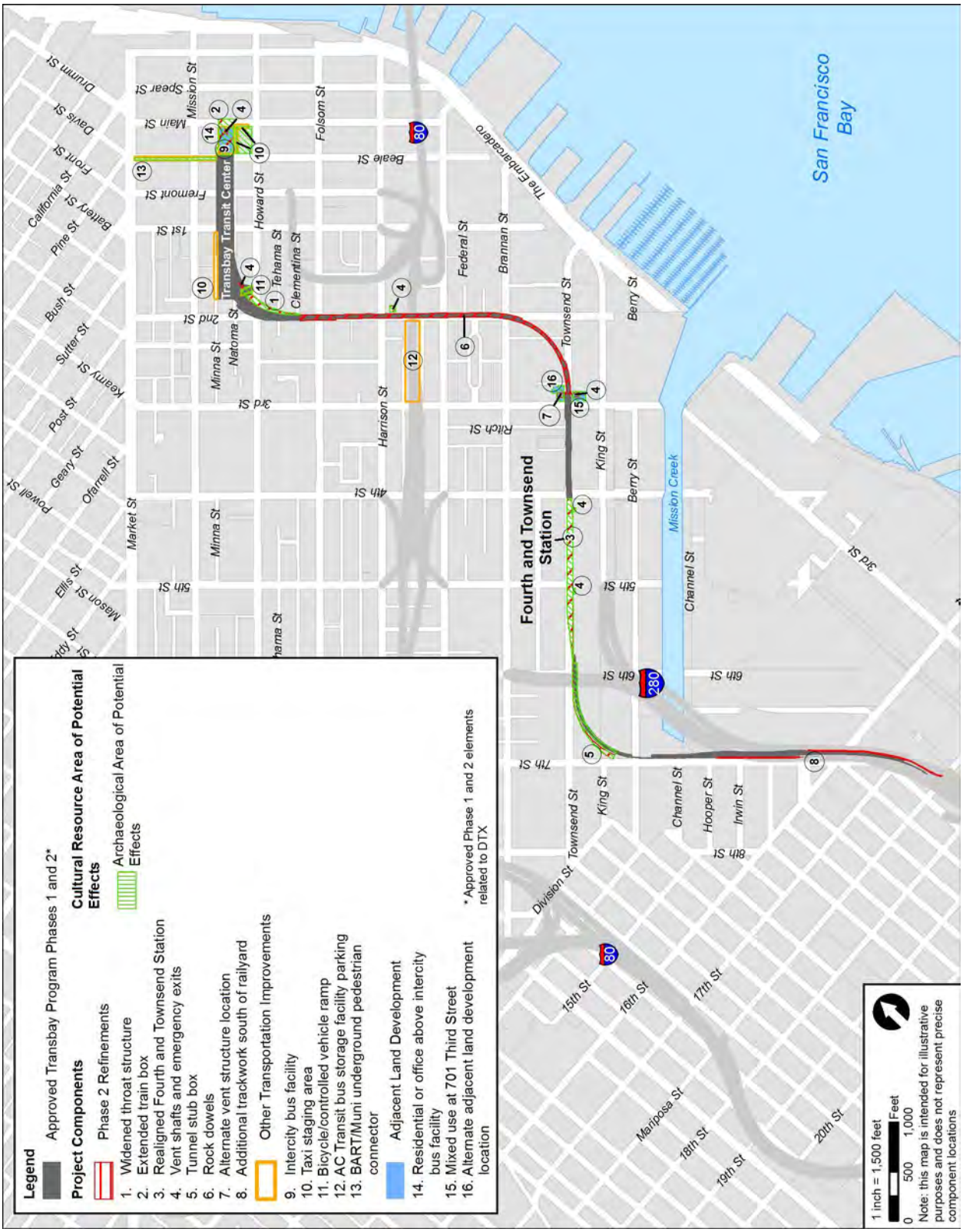
Formal consultation with the SHPO for the supplemental Section 106 studies began in July 2015, and a letter from FTA to the SHPO asking for concurrence on the APE Amendment and Supplemental Section 106 report was transmitted in September 2015 (see Appendix G.1 of the Draft SEIS/EIR). Following informal consultation with FTA, SHPO, and TJPA in October 2016, a final finding of effect for the proposed project was completed (see Appendix B.1) and a letter requesting SHPO concurrence on the finding of effect was submitted on February 17, 2017 (Appendix B.2). The finding of effect reports that the effect of the overall Transbay Program (i.e., the undertaking as defined for purposes of Section 106) remains adverse; however, the proposed project would not result in adverse effects or any additional adverse effects beyond those previously analyzed. Concurrence from SHPO was received that the proposed project would not result in additional adverse effects to built environment properties and that there should be continued consultation to determine the appropriate course of action for protection of archaeological resources. This letter is included as Appendix B.3 of this Final SEIS/EIR.

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.



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

Figure 3.6-1: Horizontal Archaeological APE

Archaeology

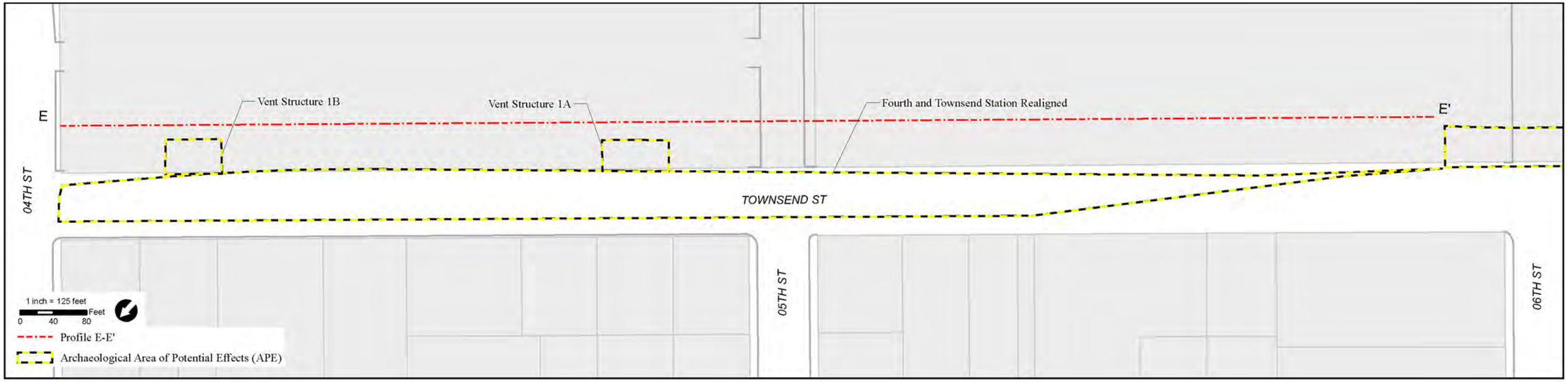
Area of Potential Effects

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.

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 of the Draft SEIS/EIR). ~~As of the publication of this Draft SEIS/EIR, SHPO concurrence has not yet been received.~~ 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.



Sources: Created by William Self Associates 2014

Figure 3.6-2a: Vertical Archaeological APE

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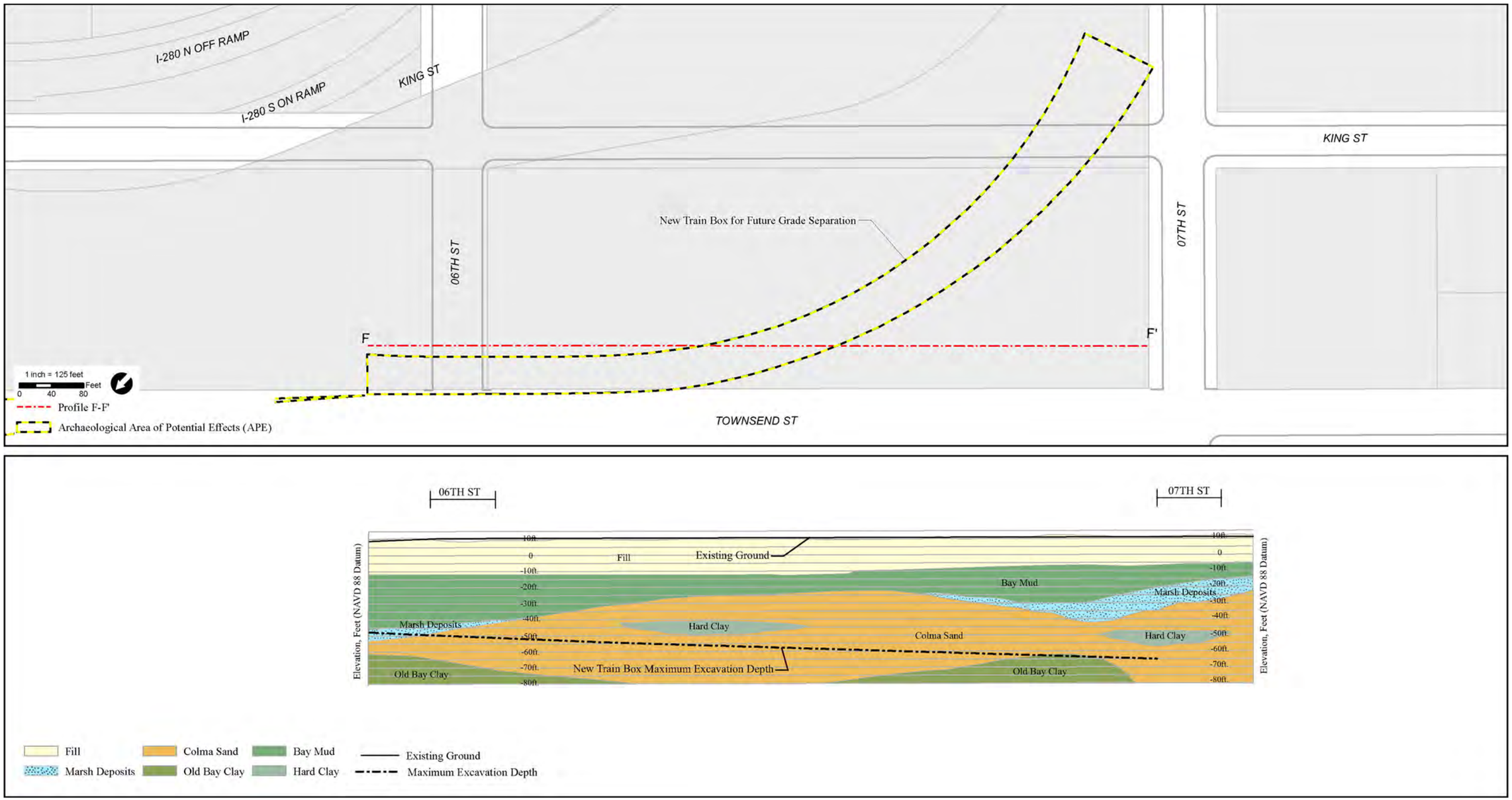

Sources: Created by William Self Associates 2014

Figure 3.6-2b: Vertical Archaeological APE

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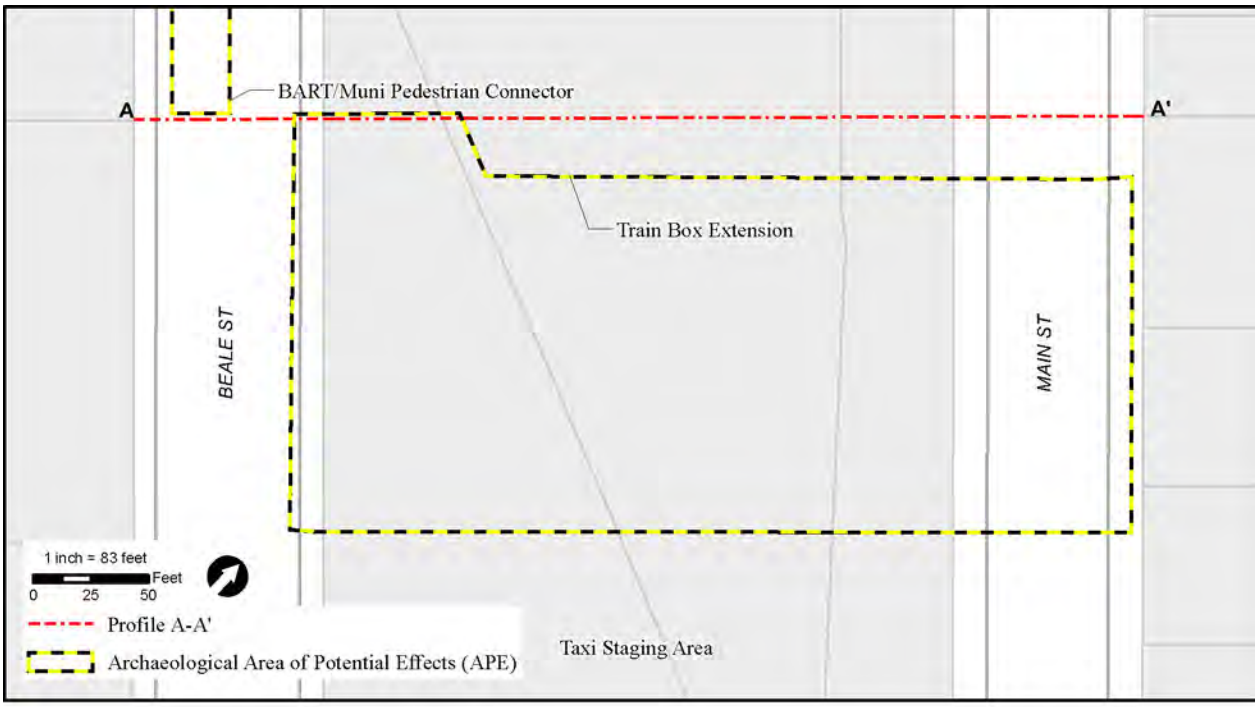
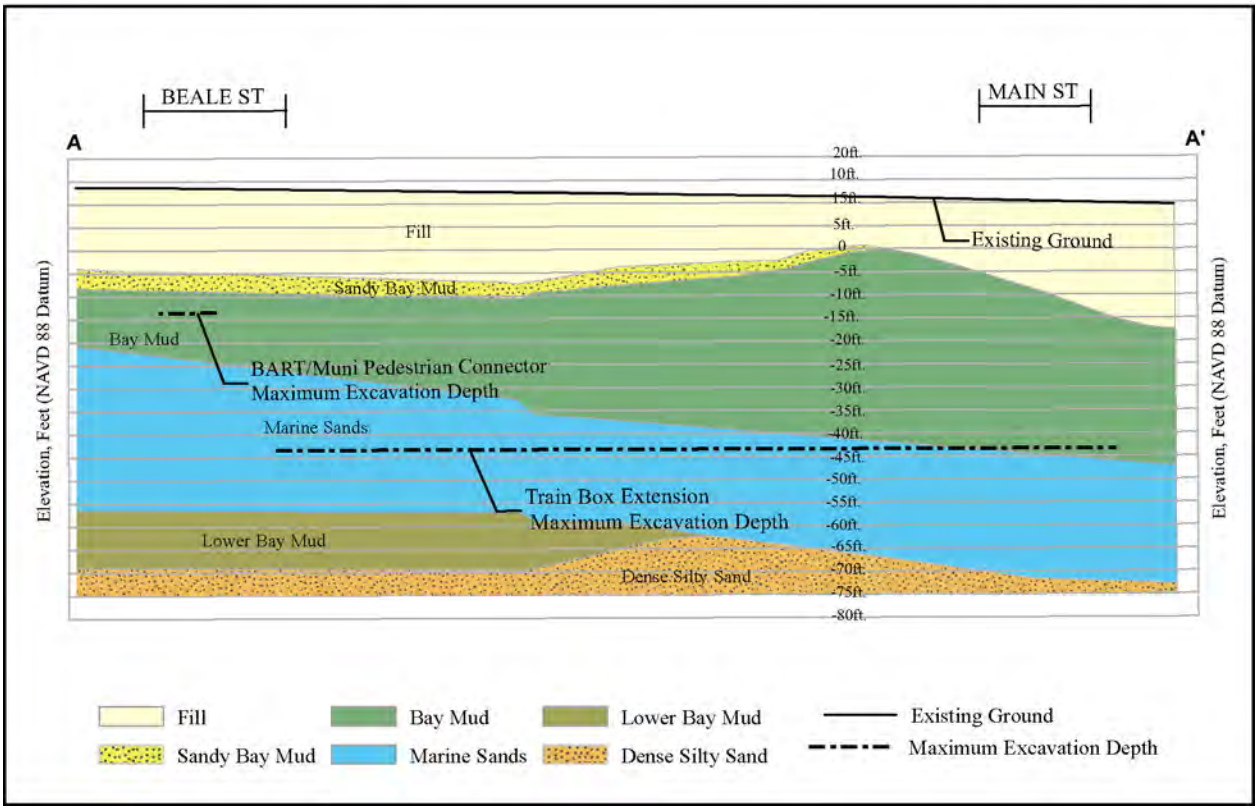
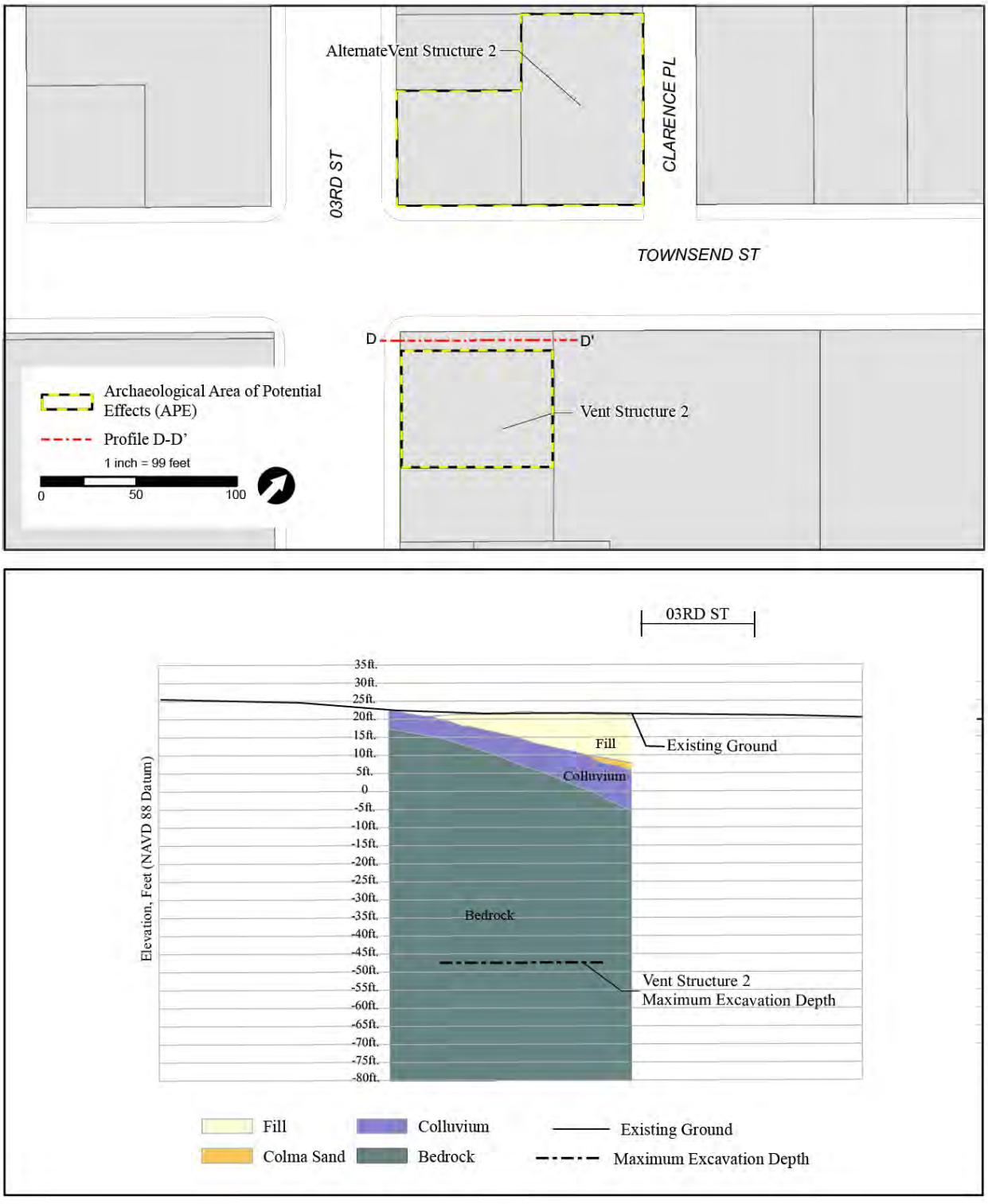




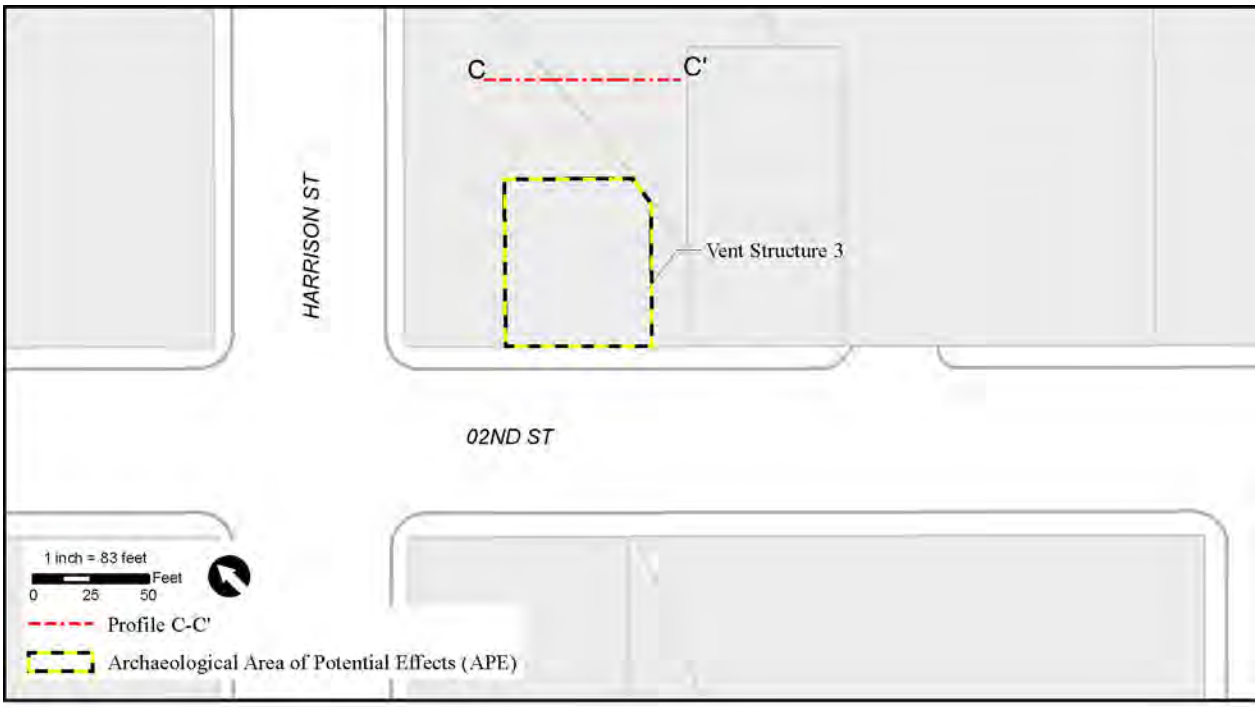
Sources: Created by William Self Associates 2014

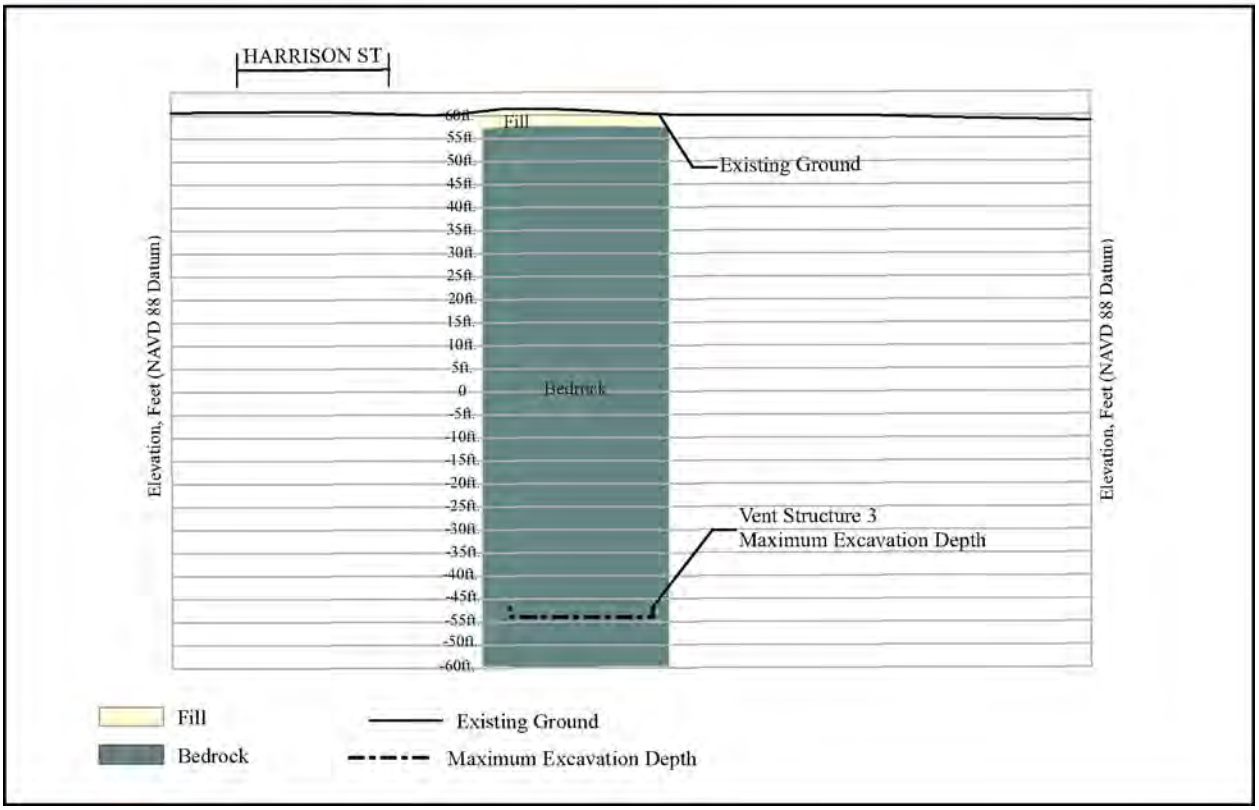
Figure 3.6-2c: Vertical Archaeological APE



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

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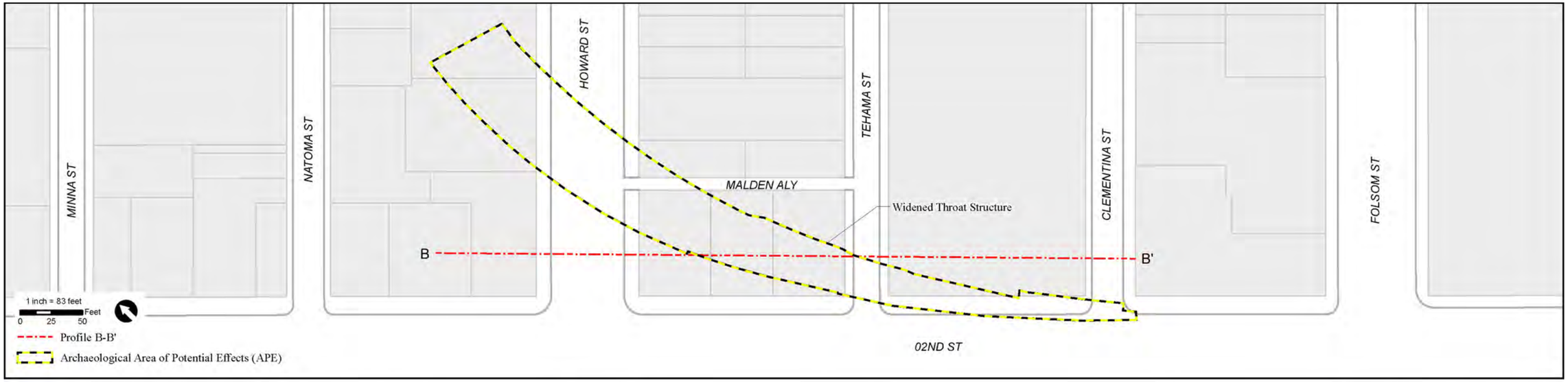

Sources: Created by William Self Associates 2014

Figure 3.6-2f: Vertical Archaeological APE

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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~~ 2010 and 2016, 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 for the proposed project revealed that two archaeological sites have been recorded within or near the proposed project Archaeological APE: CA-SFR-151/H and CA-SFR-152H. Neither resource has been listed, or formally determined to be eligible for listing, in the National Register of Historic Places (NRHP).

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. As such, the revised APE for the widened throat structure encroaches into the farthest northwest corner of this resource. Limited archaeological testing of this site for two other projects in the central portion of the block yielded late 19th-century ground surfaces, building foundations, and hollow-filled features (Anthropological Studies Center 2007; Far Western Anthropological Research Group 2010). 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, these~~is~~ discover~~y~~ies attest~~s~~ 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-152~~/~~H

The vent structure footprint at Second and Harrison Streets sits within the northwest corner of archaeological site CA-SFR-152~~/~~H, which encompasses the entire city block between Second, Harrison, First, 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-152~~/~~H 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.

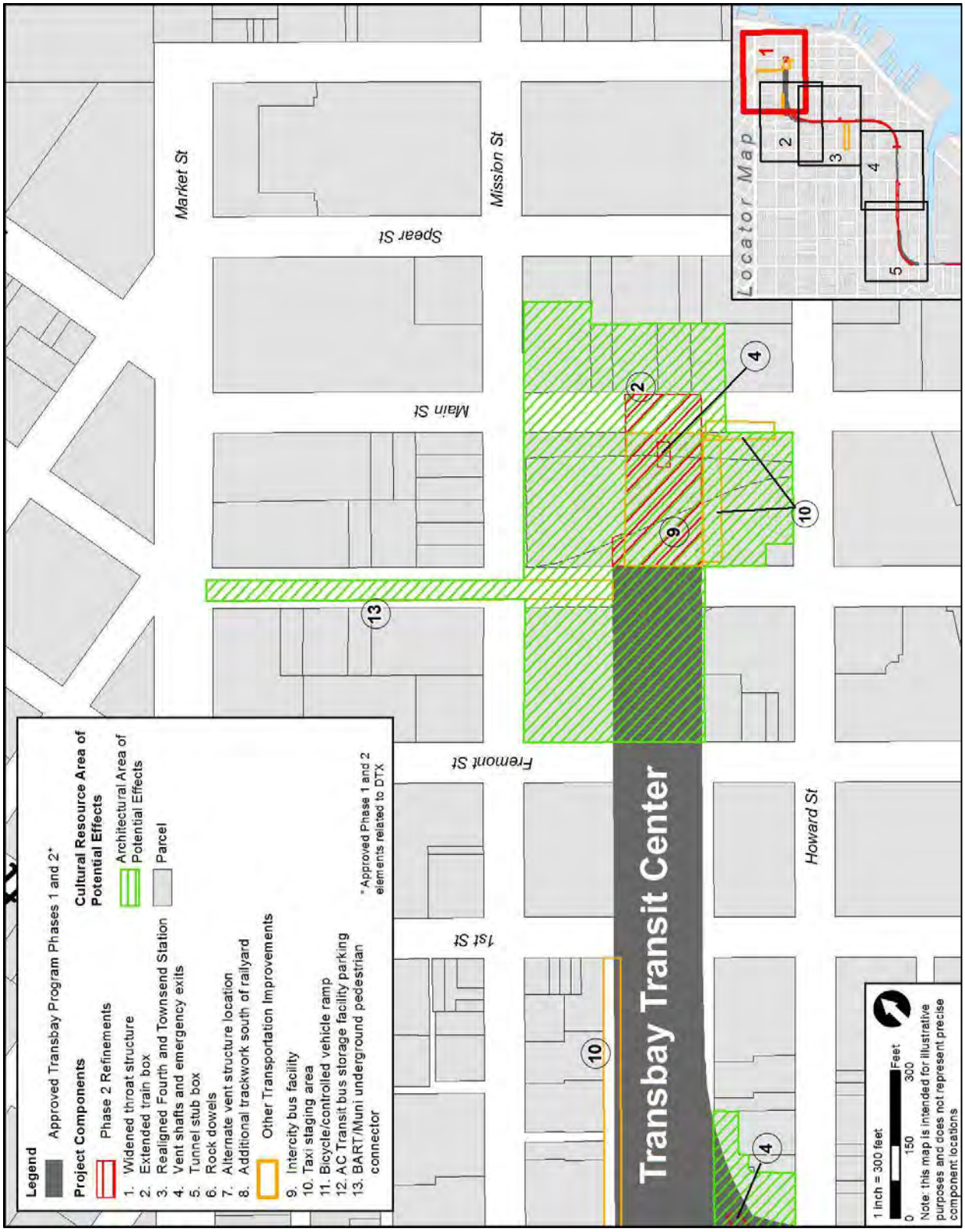
Within the footprint of the Phase 1 Transbay Program train box, in between but not within either the APE for the widened throat structure or the extended train box, the TJPA recently discovered a Native American interment at a depth of approximately 55 feet below ground surface buried within the Lower Bay Mud. The Native American Heritage Commission was contacted and designated a Most Likely Descendant (MLD) to work with the project team. The TJPA agreed to implement the MLD's recommendations made on February 28, 2014. 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.

Historic Architectural Resources

Area of Potential Effects

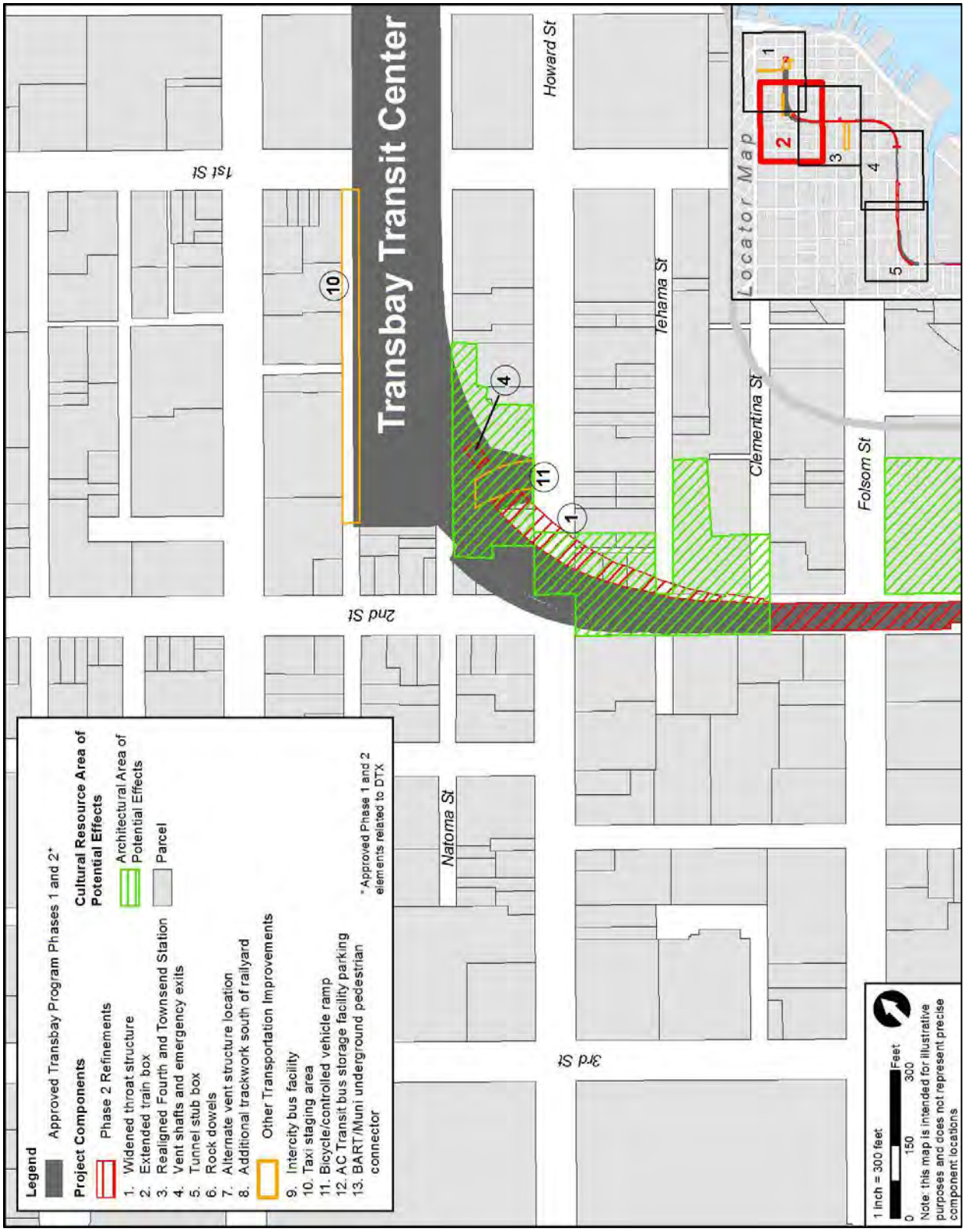
The proposed project Architectural APE includes any historic-period building, structure, or object that may be directly or indirectly affected by implementation of the project. The Architectural APE includes the extent of proposed construction for most project components (i.e., the project "footprint") 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 rights-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.



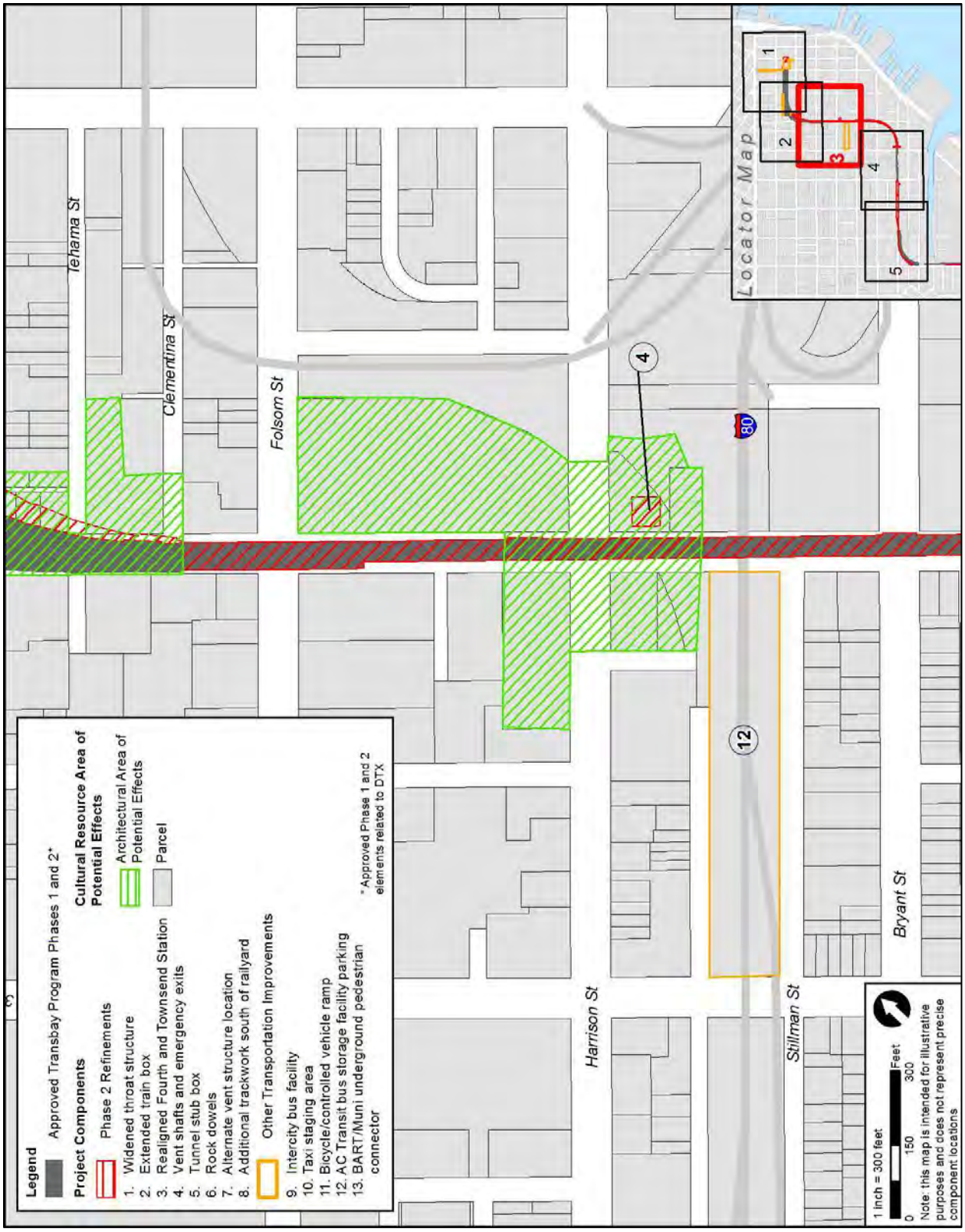
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3a: Architectural APE



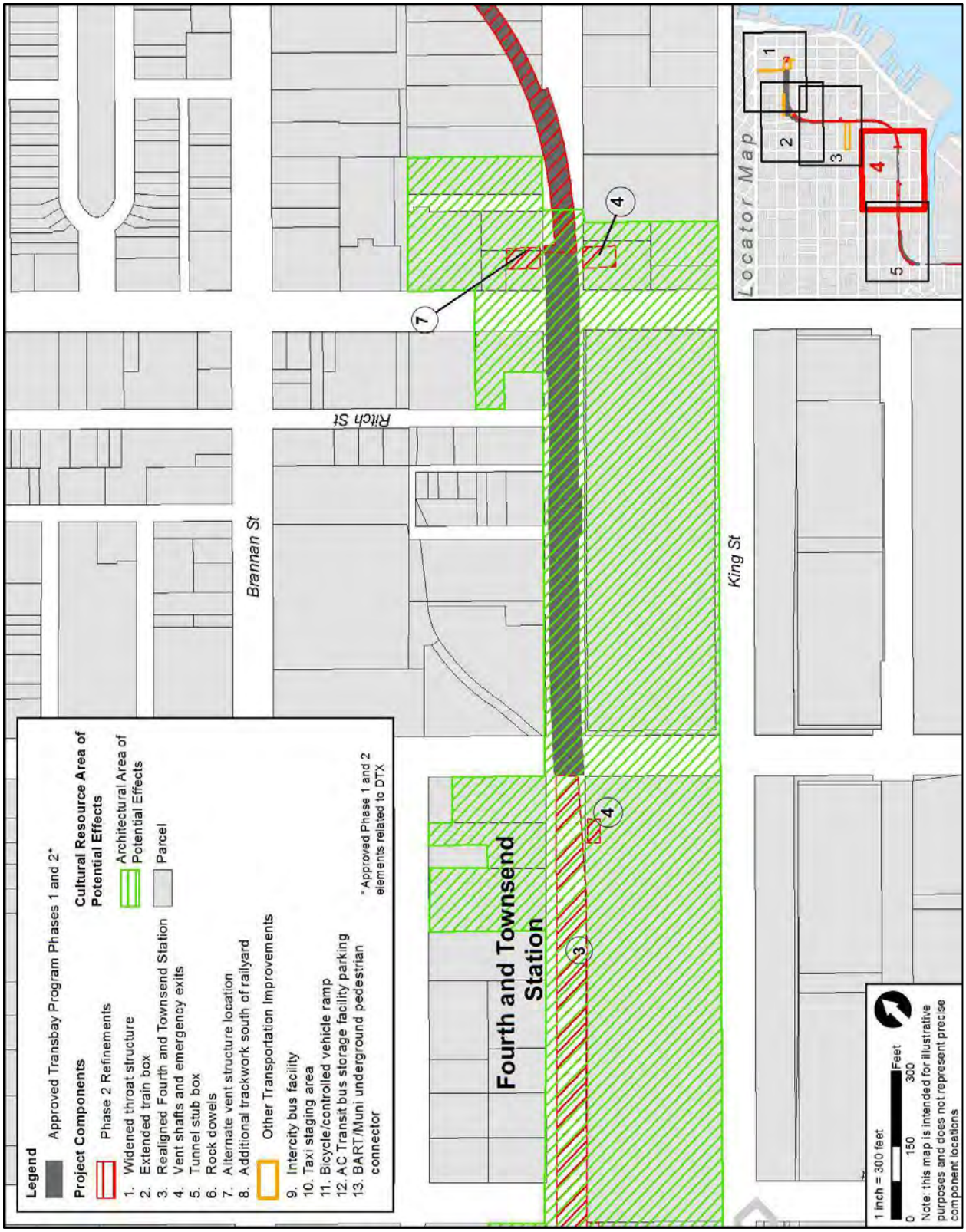
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

Figure 3.6-3b: Architectural APE



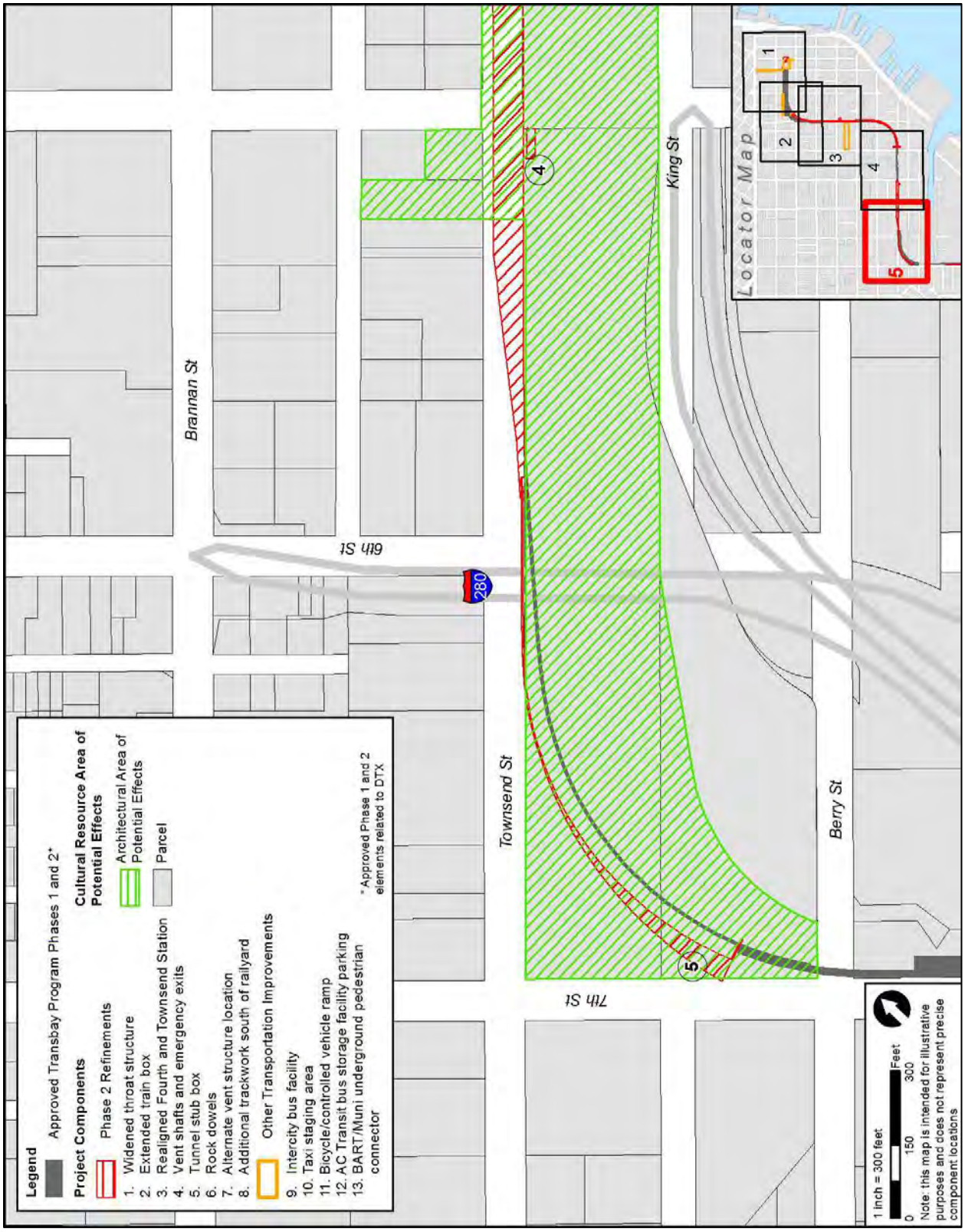
Sources: City and County of San Francisco 2013; Compiled by AECOM 2015

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

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			

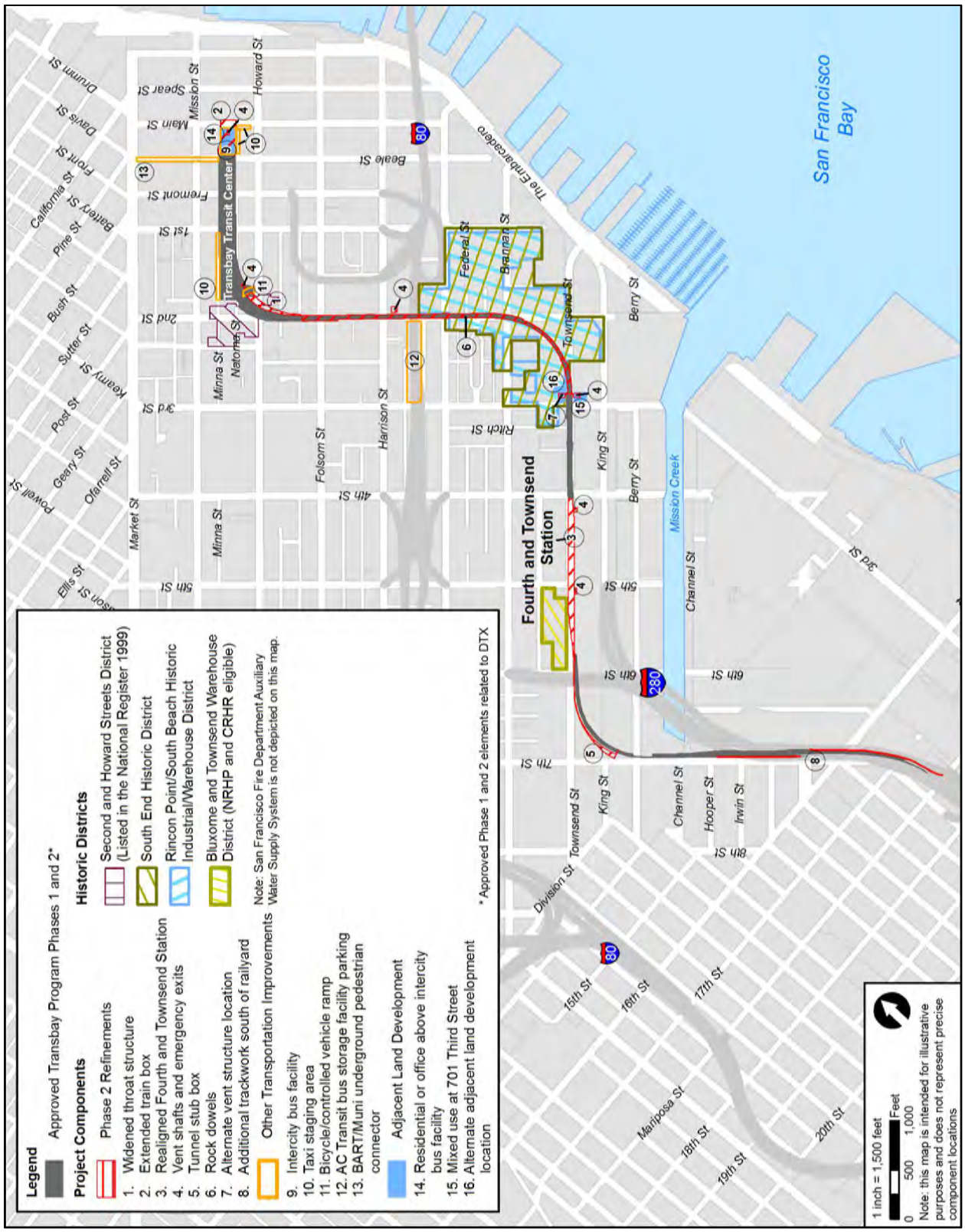
Second and Howard Streets NRHP Historic District

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



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

Figure 3.6-4: Historic Districts within the Architectural APE

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 San Francisco Historic Preservation Commission (Motion 0103) in December 1, 2010 adopted an augmentation survey that included the South End Historic District extension. The area within this boundary includes 19 properties, 12 of which have contributing buildings. The boundaries of the South End Historic District are nearly identical to the Rincon Point/South Beach Historic Warehouse-Industrial District. With this boundary adjustment, the number of properties in this district now totals 97 buildings, of which 67 are contributing buildings.

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."[18]

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. This district overlaps and is larger than the earlier described Second and Howard Streets Historic District, but is not within the architectural APE for the proposed project.

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 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.

[18] Ordinance 414-85, approved September 17, 1985.

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 Finding~~s~~ of Effect that was submitted on February 17, 2017 (see Appendix B.1)~~., 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[19] pursuant to Section 15064.5;
- 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.

[19] 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).

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~~ D of this~~e Draft~~ Final 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. As a result, the effect of the No Action Alternative remains adverse. 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 avoided ~~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~~ D of this Final~~e Draft~~ SEIS/EIR) and memorialized in the MOA (FTA 2004b). To reduce impacts to archaeological resources, TJPA has previously ~~approved~~ adopted and incorporated into the Transbay Program the measures summarized below and provided in full in Appendix ~~C~~ D of this Final~~e Draft~~ SEIS/EIR:

- **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.

As previously explained, the measures shown above are memorialized in the executed MOA. Specifically, measures for the treatment of as-yet undiscovered archaeological resources are included in the MOA as Stipulation IV.B (Treatment Plan) and Stipulation IV.C (Treatment Plan Reporting Requirements) and

Stipulation IV.D (Discoveries and Unanticipated Effects), as reflected in Amendment 2 of the MOA. In order to implement Stipulation IV.B, the MOA signatories agreed to prepare individual ARDTPs for each area of ground disturbance. Since 2004, 18 ARDTPs have been prepared for the Transbay Program and other redevelopment development projects within the Transit Center District. Each ARDTP presents information on the historical context, the archaeological sensitivity, the archaeological testing and treatment plan to identify and evaluate archaeological materials uncovered during construction, and options for data recovery; artifact analysis, curation, and documentation; and public outreach strategies to recognize the extra-scientific values contained in archaeological resources. Consultation occurs with all signatories to the MOA, and ARDTPs are subject to SHPO approval. The use and implementation of ARDTPs, along with 36 CFR 800.13 regarding post-review discoveries, would continue to apply to those portions of the No Action Alternative that have not yet begun construction, and would avoid or minimize potential effects of ground-disturbing construction activities.

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~~ describing avoidance and minimization measures ~~mitigations~~ to address potential 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~~ D of this Final~~e Draft~~ SEIS/EIR) 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.

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	

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

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.

To reduce impacts to historic resources, TJPA has previously ~~approved~~ adopted and incorporated into the Transbay Program the measures summarized below and provided in full in Appendix ~~C~~ D of this Finale ~~Draft~~ SEIS/EIR:

- **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 ~~c~~would not cause a substantial adverse change in the significance of archaeological resources ~~pursuant to Section 15064.5 of the CEQA Guidelines, but~~ because this potential effect would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement that include ~~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/impact pursuant to State CEQA Guidelines

Section 15064.5 would be avoided ~~and~~ or minimized through implementation of ~~mitigation measures~~ Stipulation IV of the MOA, "Consideration of Potential Effects on and Prospective Development and Implementation of a Treatment Plan for Archaeological Resources." This MOA stipulation incorporates Mitigation Measures CH 15 through CH 20, which were previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project. These measures would continue to apply and would be implemented and monitored for the proposed project. More specifically, in order to implement Stipulation IV.B regarding a treatment plan for archaeological resources, the MOA signatories agreed to prepare individual ARDTPs for each area of ground disturbance. Each ARDTP presents information on the historical context, the archaeological sensitivity, the archaeological testing and treatment plan to identify and evaluate archaeological materials uncovered during construction, and options for data recovery; artifact analysis, curation, and documentation; and public outreach strategies to recognize the scientific values contained in archaeological resources. Consultation on the ARDTPs involves all signatories to the MOA, and ARDTPs are subject to SHPO approval. The use and implementation of ARDTPs, along with 36 CFR 800.13 regarding post-review discoveries, would continue to apply to the proposed project and would apply to, but would not be limited to, the widened throat structure, the extended train box, the vent structures, the tunnel stub box, and the underground pedestrian connector. Therefore, potential effects to documented as well as undiscovered archaeological resources as a result of the proposed project would be avoided and/or reduced and no mitigation for archaeological resource effects/impacts would be needed. 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~~ recorded archaeological sites ~~resources or~~ and documented human remains within or near the proposed project footprint, as discussed below~~.~~; however, the executed MOA and the established process and procedures that govern the preparation, review, and approval of the ARDTPs would avoid or minimize potential adverse effects on archaeological resources. 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~~ Appendix B.1 of this Final SEIS/EIR, 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 t~~The boundaries of the APE of the widened throat structure pass~~es~~ through the western edge of this city block and archaeological site, and ~~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). L~~limited archaeological testing for two other projects in ~~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 (Anthropological Studies Center 2007, Far Western Anthropological Research Group 2010). In addition, a prehistoric interment was discovered in February 2014 within the Phase 1 train box footprint, which lies outside the widened throat structure APE (but less than two city blocks away). Construction of the widened throat structure, therefore, 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 in February 2014 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 originally proposed vent structure sits adjacent to the DTX alignment, but is no longer available because it has been redeveloped as a hotel that is scheduled to open in late 2018. 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 this~~e~~ ~~alternate~~ location considered for a vent structure at the northeast corner of Third Street and Townsend Street, which is now the preferred site for the structure, would be approximately the same as the ~~preferred~~ site at the southeast corner (see above description for 701 Third Street). 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 Rincon Point/South Beach Historic Industrial Warehouse District, and, although the historic districts ~~is~~ are 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, which were 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, *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 ~~c~~would not cause direct adverse impacts on historic architectural resources, ~~but this~~ because such potential effects would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement that include ~~with~~ ~~modifications to the~~ previously adopted mitigation measures for the Transbay Program. (No Adverse Effect/Less-than-Significant ~~with Mitigation~~)

Similar to Impact CR-1 regarding archaeological resources, Impact CR-2 concerning historic architectural resources concludes that there would be no adverse effects pursuant to NEPA and Section 106 or significant impacts pursuant to State CEQA Guidelines Section 15064.5. Any potential adverse effect/significant associated with the proposed project would be avoided or minimized through implementation of Stipulation III of the 2004 MOA with the SHPO, "Mitigation of Effects on Second and Howard Streets Historic District and Protective Measures for Rincon Point/South Beach Historic Warehouse Industrial District." This MOA stipulation incorporates Mitigation Measures CH 11 through CH 13, which were previously identified in the 2004 FEIS/EIR and adopted and incorporated into the project. These measures would continue to apply and would be implemented and monitored as part of the proposed project. Therefore, potential effects would be avoided and/or reduced and no mitigation for historic architectural resource effects/impacts would be needed. Therefore, the proposed project would have a no adverse effect/less-than-significant impact on historic architectural resources in the APE. A description of each proposed project refinement and the impacts on applicable historic architectural resources is presented below.

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 Streets 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~~ D of this~~e Draft~~ Final 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,~~ ~~t~~The following construction methods have been included as part of the project to avoid ~~this~~ potential impacts to the property and to preserve the building at 589 Howard Street. 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. Preventive actions are already in place in MOA Stipulation III.A, which defines protective measures during construction (including CH 11 and CH13 from the 2004 FEIS/EIR) that could affect contributing elements to the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District. As a result, the underground easement and underpinning associated with the widened throat structure would not result in an adverse/significant effect. ~~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 Streets 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. Preventive actions related to potential construction-induced impacts are required by MOA Stipulation III.A, which defines protective measures during construction (including CH 11 and CH13 from the 2004 FEIS/EIR) that could affect contributing elements to the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District. As a result, the underground easement and underpinning associated with the widened throat structure would not result in an adverse/significant effect on the Second and Howard Streets Historic District. Although the City's New Montgomery Street, Second Street, and Mission Street Conservation District is outside the APE, it is adjacent to the APE. The same protective measures, described below, would avoid indirect impacts on this district. ~~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, Mitigation Measure CH 13, described above would apply 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 Streets 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, which were 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 avoided or 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. Due to construction

underneath the buildings, Mitigation Measure CH 11 would be amended to add 165-173 Second Street to the list of ~~affected~~ historic properties with nearby construction. 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 be implemented and avoid or ~~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~~ D of this~~e Draft~~ Final 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 originally proposed vent structure at 701 Third Street has no potential to directly impact historic architectural resources. Since the release of the Draft SEIS/EIR, this site was sold and has been redeveloped with a hotel that is scheduled to open in late 2018. ~~The site currently contains a fast food restaurant (constructed in 1970), which would be demolished to make way for the vent structure.~~ The site was occupied by a fast food restaurant that 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 is now the preferred site for the structure and 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 and Rincon Point/South Beach Historic Industrial Warehouse 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); this non-contributor designation also applies to the Rincon Point/South Beach Historic Industrial Warehouse District. In the 2008 update to the South End H~~h~~istoric D~~d~~istrict, 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. In 2010, the South End Historic District boundaries were expanded to the west, increasing the total number of buildings in the district to 97, of which 67 are contributing buildings; this expansion did not apply to the Rincon Point/South Beach Historic Industrial Warehouse District.

The demolition of one contributor and one non-contributor would not result in a significant impact on the South End Historic District and Rincon Point/South Beach Historic Industrial Warehouse District because the historical integrity of the districts would remain intact ~~strong as a whole~~, with ~~54~~ the remaining contributors continuing to be a high percentage of the total number of buildings in the districts, and because the visual quality and character of the remaining ~~and with the retention of a strong~~ row of contributing buildings to the east of 180 Townsend to Second Street and to the north along Third Street would continue to convey the districts' significance. ~~However~~ In addition, the introduction of the vent structure at this corner location at the edge of the historic districts ~~c~~would not result in an adverse or significant impact, ~~unless~~ because the new design would follow~~s~~ 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 South End Historic District and Rincon Point/South Beach Historic Industrial Warehouse District (one of which is a contributor to the districts) 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 (1) the integrity of the historic districts would not change such that the features and attributes that qualify it for the National Register would be adversely affected, and (2) the TJPA will require that the new design follows guidelines protective of the historic character of the area such as 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. The 2004 MOA with the SHPO was approved for the Transbay Program and would apply to all components of the proposed project with a potential to affect a historic resource. The MOA includes Mitigation Measures CH 11, CH 12, and CH 13, which were included in the 2004 FEIS/EIR, were adopted and incorporated into the Transbay Program, and would continue to apply to the proposed project. 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 and would be amended to include 165-173 Second Street to the table of affected historic properties during construction. Mitigation Measure CH 11 would be amended as follows (see italicized text for additions and strikethrough text for deletions to previously adopted Mitigation Measure CH 11):

CH 11 – Develop and implement measures, in consultation with the owners of historic properties immediately adjoining the construction sites, to protect the contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District from damage by any aspect of the Project. Such measures will include, but are not necessarily limited to those identified in the MOA.

The protective measures herein stipulated will be developed and implemented by TJPA prior to the commencement of any aspect of the Project that could have an adverse effect on historic properties immediately adjoining the construction sites herein identified. In addition, TJPA will monitor the effectiveness of the protective measures herein stipulated and will supplement or modify these measures as and where necessary in order to ensure that they are effective. The historic properties covered by the terms of this paragraph are shown in the following table.

Affected Historic Properties During Construction

Address/ Assessors Parcel Number	NRHP Status	Contributing Element of	Const. Date	Type of Impact
589-591 Howard Street/3736-098	1D	Second & Howard District & New Montgomery/ Second Street	1906	Cut-and-cover construction nearby; need easement
163 Second Street/3721-048	1D		1907	Cut-and-cover construction nearby
165-173 Second Street/3721-025	1D		1906	Cut-and-cover construction; need easement
166-78 Townsend Street/3788-012	3D	Rincon Point/South Beach District & South End District	1910 [1] 1988 [2]	Cut-and-cover construction nearby. Need construction easement
640 Second Street/3788-002	252	Rincon Point/South Beach District & South End District	1926	Tunnel under or near property
650 Second Street/3788-049 through 3788-073	252		1922	
670-680 Second Street/3788-043, 3788-044	252 (670), 3D (680)		1913	
301-321 Brannan Street/3788-037	3D		1909	
130 Townsend Street/3788-008	3D		1910 [1] 1895-6 [2]	
136 Townsend Street/3788-009	3D		1902 [1] 1913 [2]	
144-46 Townsend Street/3788-009A	3D		1922	
148-54 Townsend Street/3788-010	3D		1922	
162-164 Townsend Street/3788-081	3D		1919	

Notes: National Register 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 the consensus of the SHPO and federal agency
1D Listed on the National Register 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
[1] Caltrans, 1983, [2] Corbett and Bradley, 1996
Source: JRP Historical Consulting, Parsons Transportation Group, 2001

~~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 and Rincon Point/South Beach Historic Industrial Warehouse District (180 Townsend Street) would be not adverse because the historic integrity of the districts would remain intact. ~~mitigated by amending~~ Mitigation Measure CH 12 would continue to apply and would be amended, as described below, and the change would be recorded 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 South End Historic District and 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.

Mitigation Measure CH 13 requires plans for repair of inadvertent damage that may occur to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District and also would apply.

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~~) Paleontological 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 adverse effect on recorded archaeological ~~resources~~ sites and no adverse effect on currently unidentified archaeological resources, because potential effects would be avoided or minimized in accordance with stipulations of the 2004 MOA with the SHPO that includes ~~because~~ mitigation measures (CH 15 through CH 20) previously adopted and incorporated into the Transbay Program as part of the 2004 FEIS/EIR. New or amended ARDTPs will be prepared for proposed project components involving ground-disturbance and excavation. Each ARDTP will present information on the historical context, the archaeological sensitivity, the archaeological testing and treatment plan to identify and evaluate

	archaeological materials uncovered during construction, and options for data recovery; artifact analysis, curation, and documentation; and public outreach strategies to recognize the extra-scientific values contained in archaeological resources. Consultation on the ARDTPs involves all signatories to the MOA and ARDTPs are subject to SHPO approval. The use and implementation of ARDTPs, along with 36 CFR 800.13 regarding post-review discoveries, would continue to apply to the proposed project and would avoid or minimize potential effects of ground-disturbing construction activities. ~~because construction activities would cause only temporary impacts on cultural resources.~~ Similarly, because of previously adopted mitigation measures (CH 11 and CH 13), protective measures are already identified and will be implemented to avoid or minimize potential effects to architectural resources, including ~~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 buildings that are contributors to historic districts ~~properties~~ (underpinnings under 589 Howard Street and 165-173 Second Street), and the ~~direct effect on a historic property~~ demolition of a building at 180 Townsend Street (~~alternate~~ now the preferred 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 165-173~~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 be not 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, but would avoid or minimize such impacts through the adopted measures and implementation of the ARDTPs. 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 not result in new potentially significant impacts on historical resources ~~not identified in the 2004 FEIS/EIR~~ because such effects would be avoided or minimized in accordance with stipulations of the 2004 MOA that include previously adopted mitigation measures. Such measures include actions to protect the contributor buildings of the Second and Howard Streets Historic District ~~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~~ and the South End Historic District and Rincon Point/South Beach Historic Industrial Warehouse District (~~alternate~~ now the preferred

	location for vent structure at Third and Townsend Streets) that could be affected by the proposed project. ~~However, t~~These ~~impacts~~ proposed project would not worsen or change the impact significance identified in the 2004 FEIS/EIR. ~~and~~ Impacts would be ~~reduced to a~~ less- than- significant ~~level~~ because of ~~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.

2.12 UPDATED SECTION 3.8.2, WATER RESOURCES AFFECTED ENVIRONMENT AND SECTION 3.8.3, WATER RESOURCES ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.8.2, Water Resources Affected Environment, is reproduced below and is amended to acknowledge the rescinding of Executive Order 13690; and Section 3.8.3, Water Resources Environmental Consequences and Mitigation Measures, is reproduced below and is amended to clarify the mitigation measures and assess other construction methods.

3.8.2 Water Resources 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.

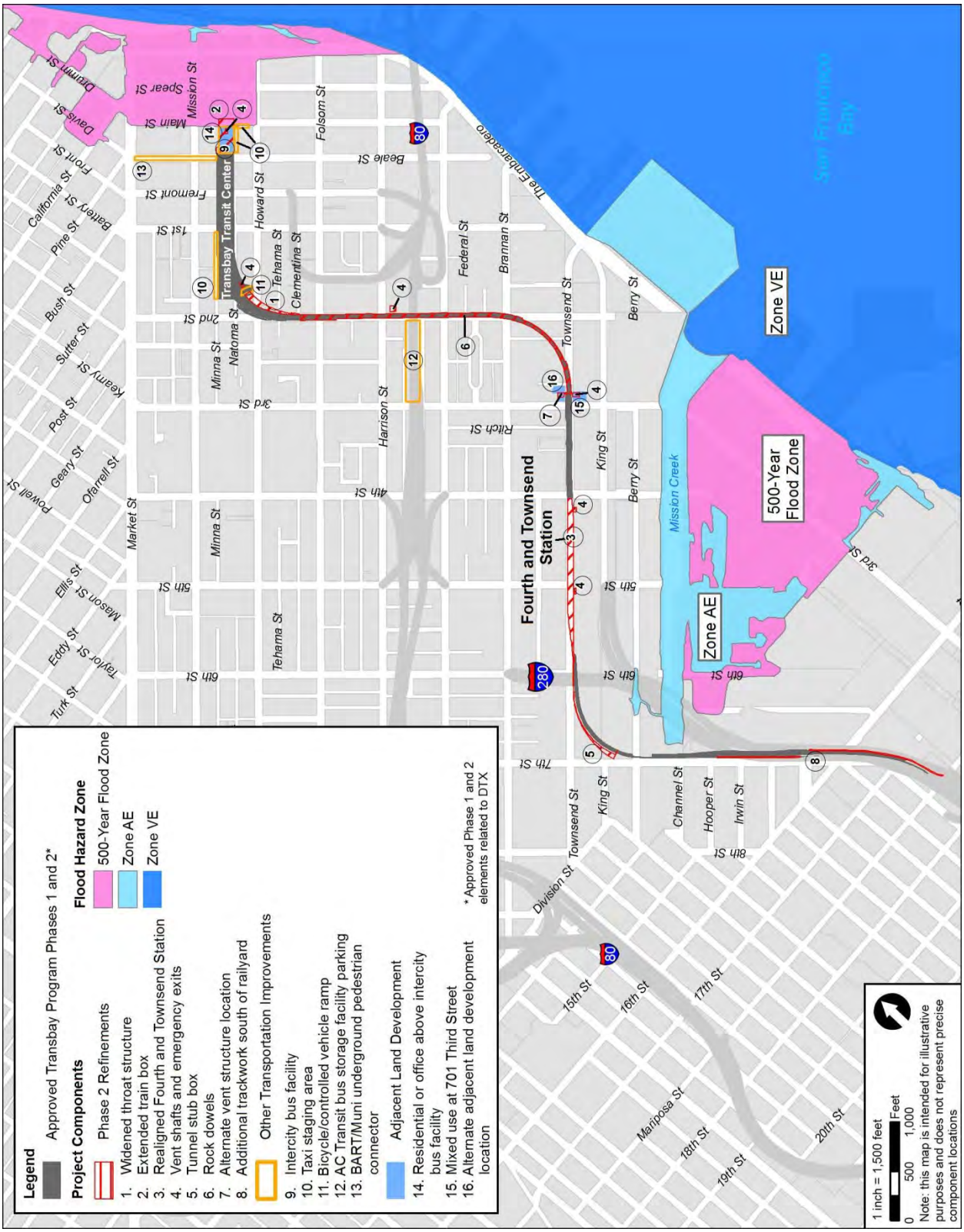
Executive Order (EO) 13690 amending EO 11988 was signed on January 30, 2015, modifying the definition of the floodplain for the purposes of FEMA floodplain management. As described later in this section under the Regulatory Framework, EO 13690 describes several alternative approaches for determining 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,[20] 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.[21] 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

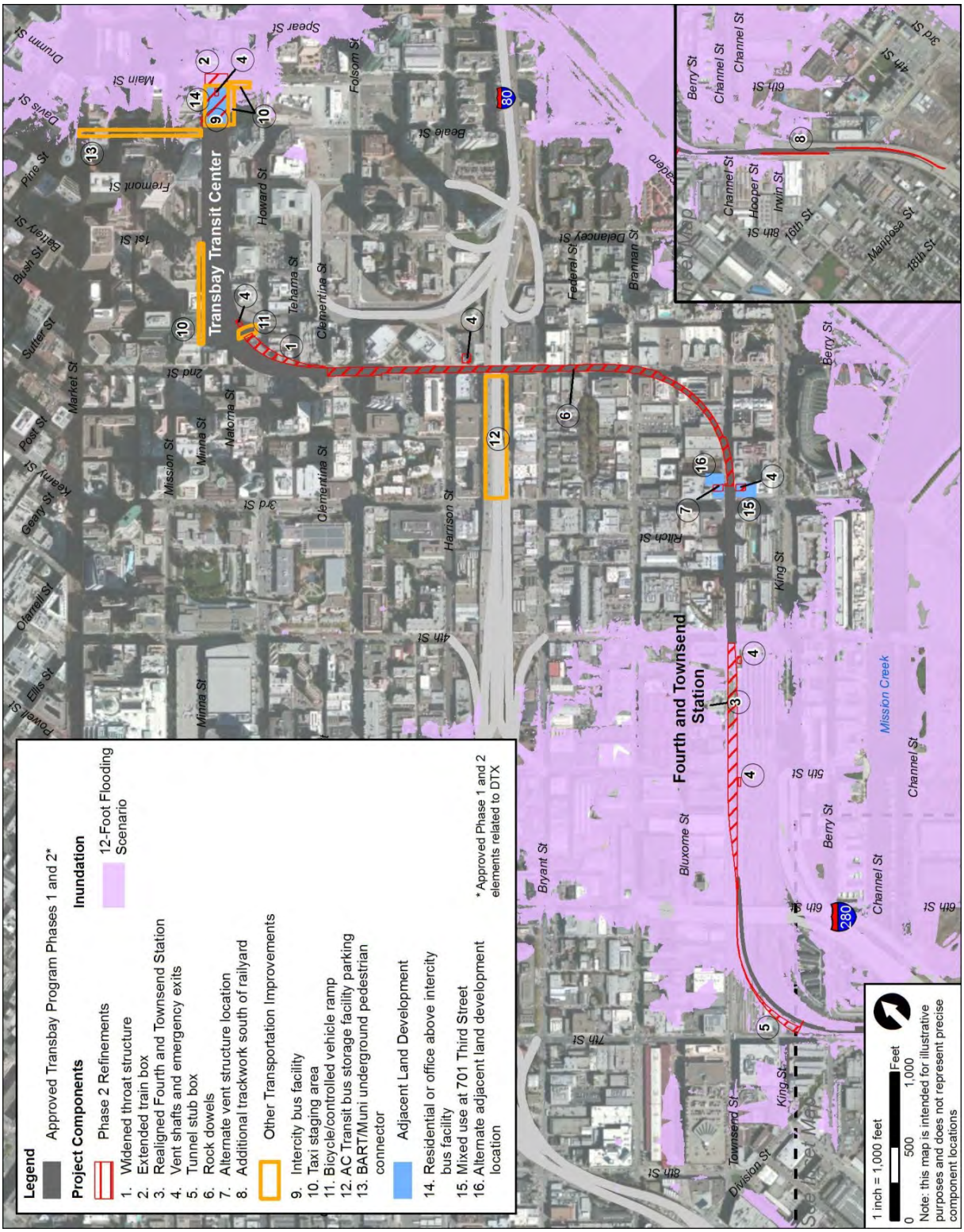
[20] EO 13690 states that for non-critical actions, 2 additional feet must be added to the base flood elevation to determine the pertinent floodplain. For critical actions, 3 additional feet must be added. A "critical action" is defined in the Regulatory Framework. In August 2017, after the publication of the Draft SEIS/EIR, the President rescinded EO 13690. Nevertheless, the information on flood hazards is still useful to understand potential environmental consequences.

[21] 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.

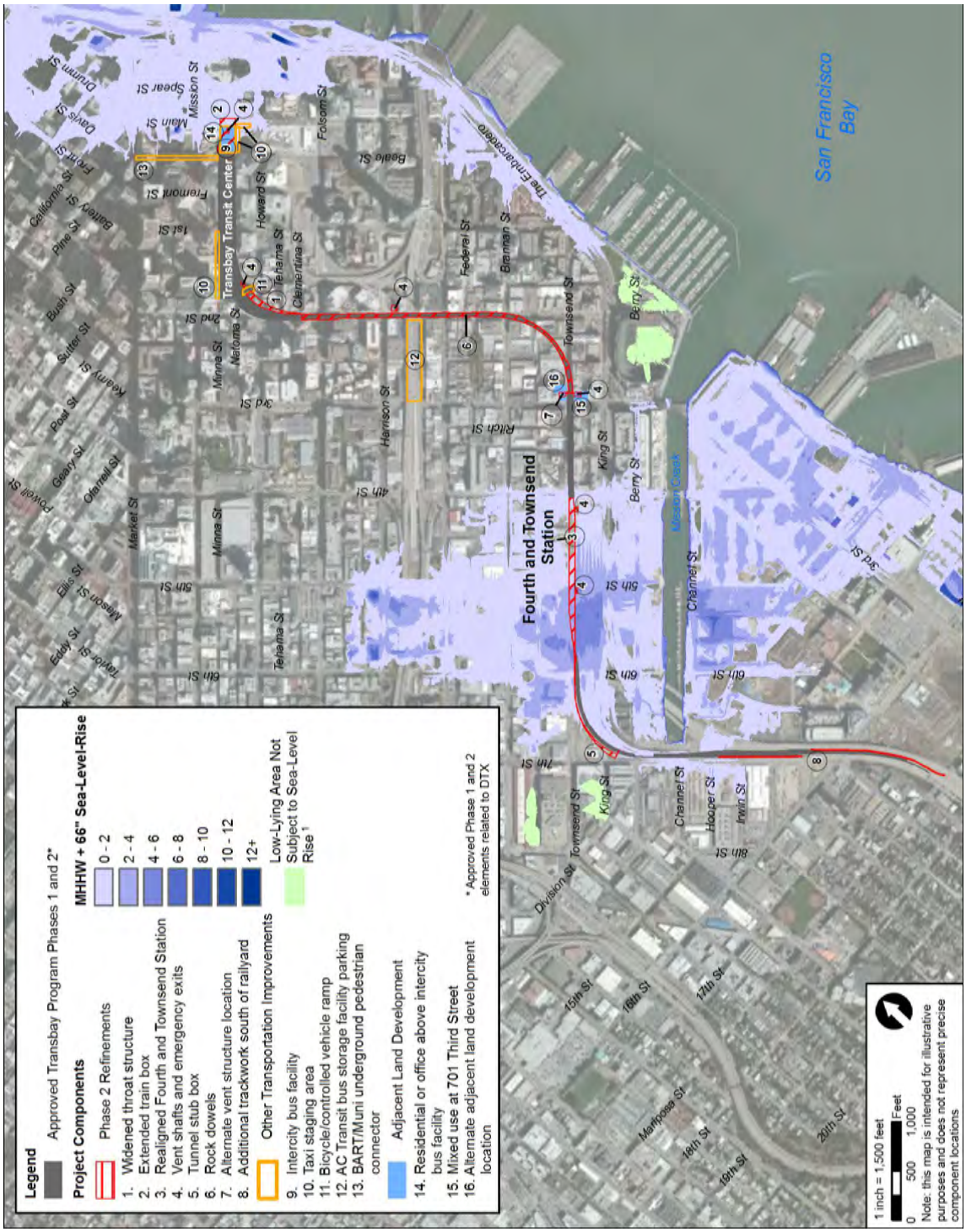
Figure 3.8-2: Flood Hazard Mapping in the Project Area for the 100-Year Flood Base Flood Elevation (10 feet) plus 2 feet (12-Foot Flooding Scenario)

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

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 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

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

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.

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.

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

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.

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]

- ~~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

[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)]~~

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 Water Resources 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~~ D of this~~e Draft~~ Final 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~~ D of this Final~~e Draft~~ 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 originally proposed vent structure at 701 Third Street and adjacent land development would have been ~~be~~ constructed on a site occupied by a fast food restaurant and associated surface parking, but this site is no longer under consideration since it has been sold and redeveloped;

- the ~~alternate~~ vent structure location at the northeast corner of Third and Townsend Streets, now the TJPA's preferred site, 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, f~~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, and 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 hazards. Specifically, the TJPA shall design and construct Transbay Program Phase 2 within the area delineated as being within a 100-year 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~~ sufficient freeboard above the 100-year base flood elevation to protect the rail facilities and the public from 100-year storm water entering the stations and the tunnel. Changes to the design criteria will be completed prior to the next phase of design so that these ~~new~~ standards can be incorporated into the ~~design of the next phase~~ 30 percent Preliminary Engineering design for DTX. 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~~ which 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 a ~~the~~ flood hazard area ~~plain 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.

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, there are two segments evaluated for cut-and-cover construction in the Draft SEIS/EIR that could be constructed using other construction methods – jacked box tunnel at the widened throat structure and SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place). Although the impacts associated with the construction methods evaluated in the Draft SEIS/EIR would be mitigated to not adverse/less than significant, these other construction methods could further lessen the potential for erosion, loss of topsoil, and related water quality effects, because they each involve less ground surface disturbance that can expose soils to erosion and a reduction in the amount of soil materials excavated. At the widened throat structure and along Townsend Street, these other construction methods would require groundwater control similar to cut-and-cover construction, and be subject to New-MM-C-GE-4.1 (see Section 2.13, Geology, Soils, and Seismicity of this Final SEIS/EIR) to reduce water infiltration into the excavated areas.

- The jacked box tunnel method could be used to excavate and construct the tunnel for a short segment at the Howard Street crossing – approximately 230 feet eastward along Howard Street and 80 feet across Howard Street. The difference in ground disturbance and excavated soils materials from the cut-and-cover construction method evaluated in the Draft EIS/EIR would be negligible because of the short segment where this construction method could apply. As a result, potential water resources and water quality impacts such as changes to stormwater runoff volumes, erosion and sedimentation, and groundwater movement and levels under this construction method would be similar to the not adverse/less-than-significant reported for the cut-and-cover construction technique.

- SEM would reduce the amount of ground disturbance and the potential for erosion and water quality impacts along the 1,200-foot segment along Townsend Street where this construction method could be used instead of cut-and-cover construction. This segment, which passes through Colma sand where the water table is about 15 feet below the ground surface, would require groundwater control measures as part of construction. In addition, as described in Section 2.4 of

this Final SEIS/EIR, 15- to 20-foot diameter access pits would need to be excavated from the surface approximately every 300 feet along Townsend Street to provide sites for the compensation grouting required to reduce potential settlement of utilities and building foundations that could occur with SEM. The very localized ground disturbance and potential for erosion at these access pits sites would have effects similar to those described for cut-and-cover construction, but for a much smaller area (approximately 1,500 square feet under SEM versus approximately 96,000 square feet under cut-and-cover construction). As a result, potential water quality impacts under this construction method would be less than the not adverse/less-than-significant impact reported for the cut-and-cover construction technique.

- Use of tunnel boring machines with SEM would have negligible additional water quality effects. The entry and exit points for the tunnel boring machines would already be disturbed since they would be the primary construction staging/work areas already identified and evaluated in the 2004 FEIS/EIR. As described above for SEM, this construction method would involve only localized and minimal ground disturbance that could contribute to erosion or loss of top soil.

In summary, these other construction methods would not alter the not adverse/less-than-significant impact identified in the Draft SEIS/EIR. They have the potential to further reduce water quality effects compared to the construction methods evaluated in the Draft SEIS/EIR, because the amount of excavated soil materials and truck trips would be less than with cut-and-cover construction. The determination of which construction method is appropriate for the proposed project will be made following further design and evaluation of the construction methods' cost and schedule implications, constructability, and environmental and public policy considerations.

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.,~~ the 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 shall design~~s~~ 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 projected 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 separately by agencies other than ~~separate from~~ the TJPA, but that will also provide flood~~ing~~ risk reduction 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~~ cooperation with other local or regional parties.

2.13 UPDATED SECTION 3.9.3, GEOLOGY, SOILS, AND SEISMICITY ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.9.3, Geology, Soils, and Seismicity Environmental Consequences and Mitigation Measures, is reproduced below and is amended to clarify a mitigation measure and assess other construction methods.

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~~ D of this Final 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~~ D of this Final 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~~ D of this Final 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~~ D of this Final 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~~ D.

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)

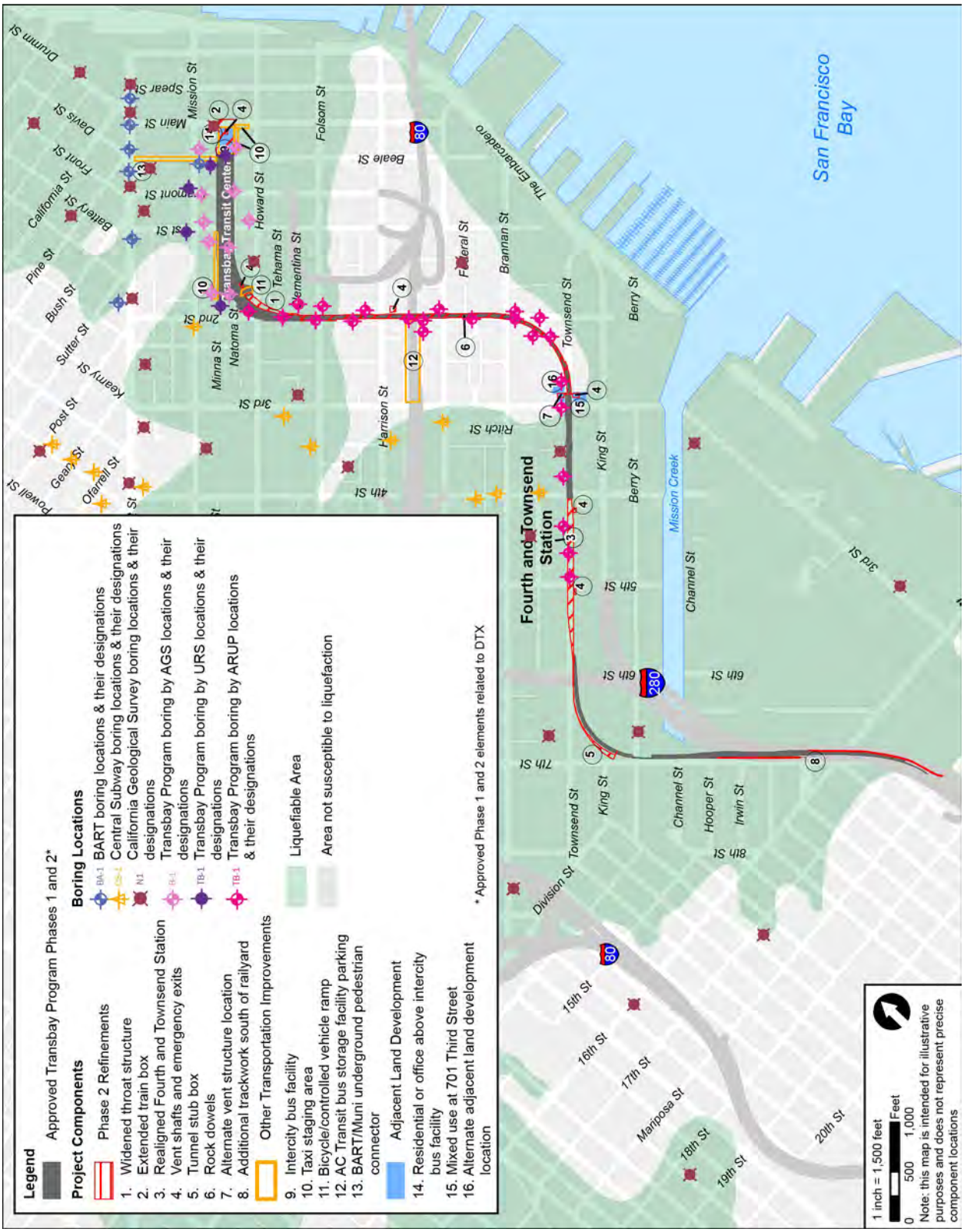
Ground failure associated with liquefaction, lateral spreading, and earthquake-induced spreading are possible results of earthquake-induced settlement. Based on the soil profile, approximately 6 to 12 inches of settlement and liquefaction throughout the project area may occur during a major earthquake.

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.

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.

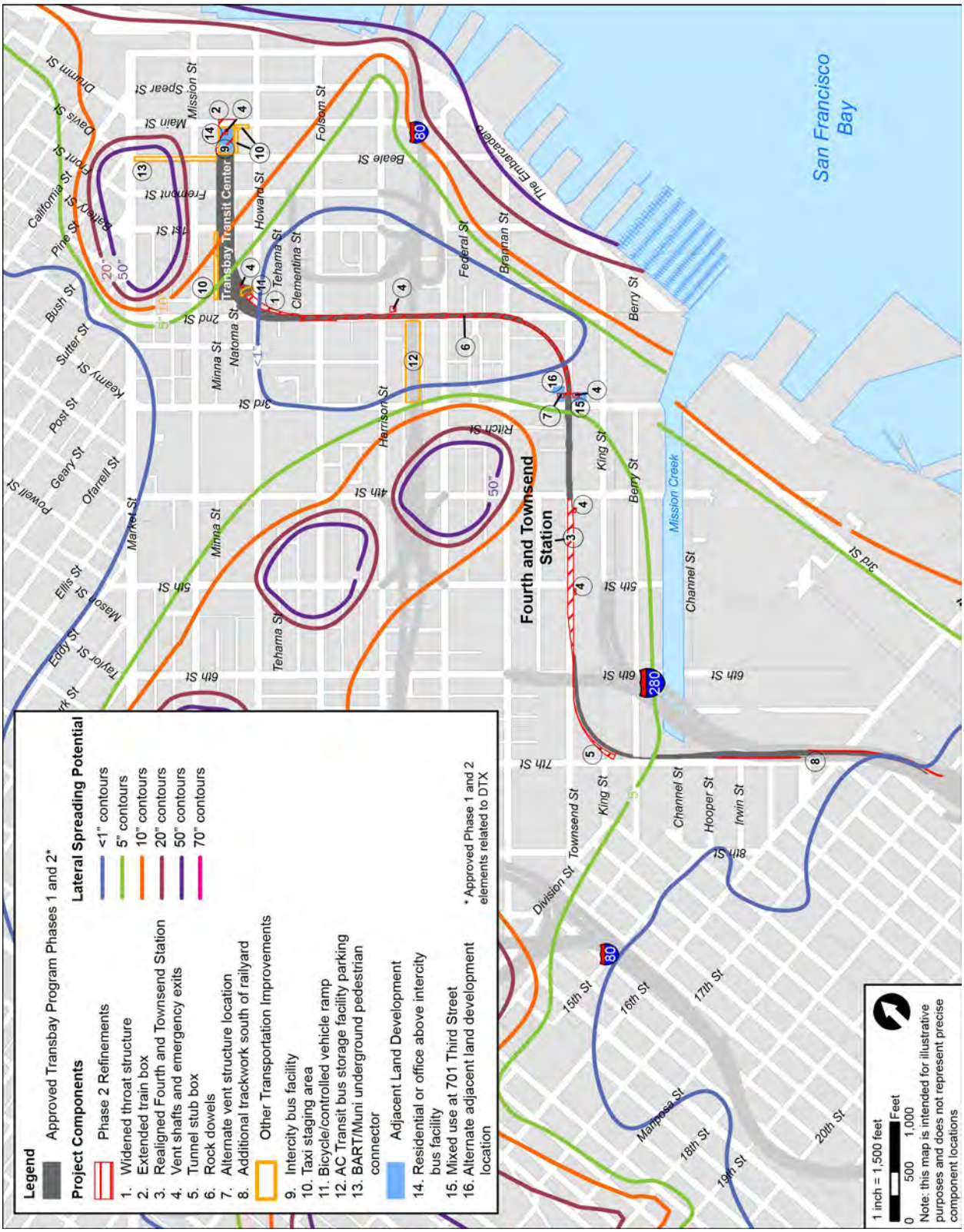


Sources: Aetypic 2014; City and County of San Francisco 2013; compiled by AECOM in 2015

Figure 3.9-4 Liquefiable Areas with Boring Locations

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

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.
- 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.

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

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

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.

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, there are two segments evaluated for cut-and-cover construction in the Draft SEIS/EIR that could be constructed using other construction methods – jacked box tunnel at the widened throat structure and SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place). Although the impacts associated with the construction methods evaluated in the Draft SEIS/EIR would be mitigated to not adverse/less than significant, these other construction methods could further lessen the potential for settlement and effects to adjacent properties because they each involve providing additional support for the overlying soils and buildings as described below.

- The jacked box tunnel method would involve constructing a roof over the tunnel consisting of interlocking steel pipes, the concrete-filled jacked boxes, and the concrete arches between the jacked boxes, as well as permanent support columns (see Figure 2-22b). These elements of the jacked box tunnel construction method would help support the overlying soil, utilities, streets, and buildings in the immediate vicinity of the Howard Street crossing.

- SEM would include ground improvement techniques to reduce the potential for settlement; in particular, compensation grouting would make the ground surrounding the tunnel firmer and thus better able to support utilities and building foundations. The 1,200-foot segment along Townsend Street where this construction method could be used is characterized by soft ground conditions. The potential settlement impacts identified in the 2004 FEIS/EIR associated with cut-and-cover construction in this segment would be mitigated to not adverse/less than significant. SEM with ground improvement techniques, such as the proposed compensation grouting, would further reduce this impact for the approximately 20 buildings that face onto Townsend Street in this segment.

- Use of tunnel boring machines with SEM would involve installing liners in the tunnel and result in a tunnel structure (consisting of a center SEM bored tunnel with bored tunnels on either side, created using the tunnel boring machines; see Figure 2.23), which provides additional support to the overlying soils, utilities, streets, and buildings. In particular, the inclusion of the tunnel-bored portion of the tunnel would provide additional support for the opening created by SEM and also cuts off potential groundwater infiltration from the sides, thereby resulting in potentially less settlement than SEM alone. The combined use of tunnel boring machines with SEM would also involve compensation grouting that would provide further support in the soft ground conditions along Townsend Street. This construction method would reduce ground stability impacts already mitigated to not adverse/less than significant for the approximately 1,200 feet along Townsend Street where cut-and-cover construction techniques were evaluated in the Draft SEIS/EIR and along 3,200 feet in primarily hard but fractured rock along Townsend Street and Second Street where SEM was evaluated in the Draft SEIS/EIR.

Regardless of the construction method for tunnel excavation and construction, all structural components would be designed and built in compliance with the most current prevailing building codes and standards at the time of design; 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; and the TJPA DTX Design Criteria,

which includes specific chapters on geotechnical, seismic design, structural, and protection of existing buildings. As a consequence, these other construction methods would not result in settlement of ground or structures beyond established and acceptable levels. The determination of which construction method is appropriate for the proposed project will be made following further design and evaluation of the construction methods' cost and schedule implications, constructability, and environmental and public policy considerations.

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 Groundwater Control during Construction ~~*Dewatering at the Extended Train Box and Transit Center Vent*~~ *Structures Sites.* Groundwater control shall be implemented to reduce ground instability in the construction area, where excavations encroach into the prevailing groundwater table. ~~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~~.

- For excavations with the cut-and-cover technique, the groundwater level within the footprint of the excavation shall be maintained a minimum of 2 feet or more beneath the bottom of the excavation throughout construction to minimize the potential for failure of the base of the excavation due to high groundwater seepage at construction sites. The groundwater level outside of the excavation footprint shall remain unchanged.

- For excavations with the SEM construction method in rock, groundwater intrusion into the tunnel excavation is expected to be minimal and localized at joints in the rock. Groundwater seeping into the excavation shall be controlled locally by panning and piping channel inflows to sump pumps located in the portal area.

- For excavations with the SEM construction method in soft ground conditions (i.e., sands and clays), the groundwater level shall be locally drawn down to below the bottom of the excavation in order to increase the strength of the ground and reduce potential ground instability.

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.

The other construction methods, identified in Section 2.4 and depicted in Figure 2-21, would reduce the amount of ground disturbance along the streets and the total amount of soil materials excavated for tunnel construction. As a result, the no adverse effect/less-than-significant impact related to soil erosion could be further reduced with the jacked box tunnel construction method at the Howard Street crossing and SEM or SEM with tunnel boring machines along Townsend Street.

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.

2.14 UPDATED SECTION 3.11.3, ELECTROMAGNETIC FIELDS ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.11.3, Electromagnetic Fields Environmental Consequences and Mitigation Measures, is reproduced below and is amended to clarify a mitigation measure.

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.

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2.15 UPDATED SECTIONS 3.12.3 AND 3.12.4, NOISE AND VIBRATION ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES, AND SUMMARY OF PROPOSED PROJECT EFFECTS/IMPACTS

Section 3.12.3, Noise and Vibration Environmental Consequences and Mitigation Measures, is reproduced below and is amended to clarify a construction vibration impact and mitigation measure and assess other construction methods.

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 Manual (FTA 20~~06~~18) 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.

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 2018~~06~~

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 2018~~06~~

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.

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 2018~~06~~

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~~ D of this Final~~e Draft~~ 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~~ D of this Final~~e Draft~~ SEIS/EIR.

- **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~~ D of this Final~~e Draft~~ 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~~ ~~p~~Potential vibration ~~impact~~ could affect ~~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 2018~~06~~		

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/~~F~~EIR, 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.

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, there are two segments evaluated for cut-and-cover construction in the Draft SEIS/EIR that could be constructed using other construction methods – jacked box tunnel at the widened throat structure and SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place). The impacts associated with the construction methods evaluated in the Draft SEIS/EIR would be not adverse/less than significant because of the mitigation measures in the 2004 FEIS/EIR that have been adopted and incorporated into the proposed project. The exception to this conclusion is if nighttime construction were to occur, in which case such activities could exceed the City's noise threshold. It is expected that these other construction methods could lessen the overall noise impact of construction activities along the length of the segments where they could be used, because excavation and construction of the tunnel under these other methods would occur almost exclusively underground and thus would be shielded from the noise receptors in the vicinity.

- The jacked box tunnel method would involve excavating and constructing the tunnel for a short segment at the Howard Street crossing – approximately 230 feet eastward along Howard Street and 80 feet across Howard Street. The reduction in impacts would result because construction would occur underground and therefore be attenuated by the overlying soils and street pavement, compared to the cut-and-cover construction technique, which would not provide the same shielding and noise attenuation since nearby noise receptors would be exposed to noise from the construction area and activities for a period of time until the street is decked. There may be more construction activity and localized noise impacts at the construction sites associated with the delivery and use of equipment and materials associated with the jacked box tunnel method; however, this activity would occur in the same construction staging/work areas as identified for the cut-and-cover construction method. These construction areas were already identified and evaluated in the 2004 FEIS/EIR, and the mitigation measures that were adopted are incorporated as part of the proposed project. As a result, construction noise impacts under this construction

method would not result in a new or substantially more severe adverse effect/significant impact compared to those previously reported for the cut-and-cover construction technique.

- SEM would reduce the amount of street level construction noise along the 1,200-foot Townsend Street segment where this construction method could be used instead of cut-and-cover construction as evaluated in the 2004 FEIS/EIR. The reasons for the reduction in impacts are the same as described above for the jacked box tunnel construction method; namely, construction would occur almost entirely underground. In addition, SEM would result in a smaller volume of excavated soil materials, which would lessen the noise associated with the haul trucks needed to remove the excavated materials, but this reduction in haul truck trips and associated noise would be partially offset by the need to deliver materials such as concrete liners for the tunnel and for the set-up and equipment required to support the tunnel boring machines, if used. There may be more construction activity and localized noise impacts at the construction sites associated with the delivery and use of equipment and materials associated with this method; however, this activity would occur in the same construction staging/work areas as identified for the cut-and-cover construction method. These construction areas were already identified and evaluated in the 2004 FEIS/EIR, and the mitigation measures that were adopted are incorporated as part of the proposed project. As a result, construction noise impacts under this construction method would not result in a new or substantially more severe adverse effect/significant impact compared to those previously reported for the cut-and-cover construction technique.

- The 2017 Tunnel Option Study also identified the potential for using tunnel boring machines where SEM would be used. Similar to SEM by itself, the addition of the tunnel boring machines would not result in new or substantially greater noise impacts, since they would operate underground. There would, however, be increased noise in the immediate vicinity of the portals, where the tunnel boring machines would enter or exit the tunnel, due to the additional equipment associated with the tunnel boring machines. As stated above, these portal/construction areas were already identified and evaluated in the 2004 FEIS/EIR, and the mitigation measures that were adopted are incorporated as part of the proposed project. As a result, construction noise impacts associated with the tunnel boring machines would not result in a new or substantially more severe adverse effect/significant impact, compared to the construction technique evaluated in the Draft SEIS/EIR.

In summary, these other construction methods would not alter the impact conclusions identified in the Draft SEIS/EIR. Nighttime construction could still result in adverse/significant impacts even with mitigation. Nevertheless, these other construction methods have the potential to reduce noise impacts compared to the construction methods evaluated in the Draft SEIS/EIR. Implementation of Mitigation Measures NoiC 1 through NoiC 6, which were previously identified in the 2004 FEIS/EIR and adopted and incorporated into the approved Transbay Program, would apply and would minimize the construction noise effects of the planned construction method. The determination of which construction method is appropriate for the proposed project will be made following further design and evaluation of the construction methods' cost and schedule implications, constructability, and environmental and public policy considerations.

Impact C-NO-4: The proposed project ~~e~~would not result in construction vibration impacts, ~~but~~ because this potential effect would be avoided in accordance with stipulations in the 2004 Memorandum of Agreement with the SHPO that include previously approved ~~by proposed~~ preconstruction measures that will be implemented for the Transbay Program ~~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 adopted mitigation measures that will be implemented along with Stipulation III of the 2004 Memorandum of Agreement (MOA) with the State Historic Preservation Officer (SHPO) would help avoid or minimize potential vibration impacts at all buildings, and no further minimization measures ~~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; however, already approved measures in the 2004 MOA with the SHPO would require preconstruction and construction measures to protect these two buildings. As a result, the proposed project would not have an adverse effect/significant impact.

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, the jacked box tunnel method at the widened throat structure and SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place) could be used in lieu of cut-and-cover construction, which was evaluated in the 2004 FEIS/EIR and the Draft SEIS/EIR. Although the vibration impacts associated with the construction methods evaluated in the Draft SEIS/EIR would be mitigated to not adverse/less than significant, these other construction methods could further lessen the vibration effects. At the widened throat structure and along Townsend Street, these other construction methods would reduce the amount of vibration impacts, because tunnel construction activities would occur almost entirely underground and because fewer truck trips would be needed to haul

away the excavated soil materials. This reduction in truck trips and associated vibration effects would be partially offset with SEM or SEM with tunnel boring machines along Townsend Street, because these construction methods require delivery of materials such as concrete liners for the tunnel and the set up and equipment to support the tunnel boring machines, if used, that are not needed for cut-and-cover construction. These construction staging, work areas, and/or portals for SEM or SEM with tunnel boring machines would occur in the same construction staging/work areas as identified for the cut-and-cover construction method. Mitigation Measures VibC 1 through VibC 6 from the 2004 FEIS/EIR have been adopted and incorporated into the proposed project. These measures would serve to minimize construction-related vibration effects of these other construction methods and the localized sites where construction activity might be more intense. As a result, construction-related vibration impacts under the jacked box tunnel, SEM, or SEM with tunnel boring machines methods would not be expected to generate a new or substantially more severe adverse effect/significant impact, compared to the construction technique evaluated in the Draft SEIS/EIR.

~~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 implementation of previously adopted mitigation measures, construction vibration would be less than significant. The proposed project analyzed in this SEIS/EIR would not result in a significant construction vibration impact on ~~the 589 Howard Street and 171 Second Street~~ buildings, because of ~~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.~~,~~ In addition, stipulations in the 2004 Memorandum of Agreement with the State Historic Preservation Officer would minimize potential vibration impacts at historic properties in the project Area of Potential Effects.~~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~~ previously adopted mitigation and avoidance and minimization measures, 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, t~~The cumulative impacts of the proposed project would be less than significant.

2.16 UPDATED SECTION 3.13.3, AIR QUALITY ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.13.3, Air Quality Environmental Consequences and Mitigation Measures, is reproduced below and is amended to clarify a mitigation measure and assess other construction methods.

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~~ D of this Final~~e Draft~~ 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~~ D of this Final~~e Draft~~ 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~~ 2040 Plan for the San Francisco Bay Area (referred to as Plan Bay Area). Phase 2 of the Transbay Program is listed in this ~~financially~~ fiscally constrained plan, which was adopted by the MTC on ~~April 22, 2009~~ July 26, 2017 (RTPID 17-10-0038). The Federal Highway Administration and FTA made a regional conformity determination for this plan in ~~May 2009~~ on August 23, 2017, pursuant to the EPA's Transportation Conformity Rule, 40 CFR Parts 51 and 93, and the FHWA/FTA Metropolitan Planning Rule, 23 CFR 450. Phase 2 is also included in the ~~financially~~ fiscally constrained ~~2013~~ 2017 Federal Transportation Improvement Program Amendment 2017-14. ~~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 Federal Transportation Improvement Program Amendment, 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, no crossings would occur during the weekday AM and PM peak hours. This commitment not to use the turnback track during the AM/PM peak hours by Caltrain is based on current best operating and service assumptions; however, should future service requirements and operational plans result in the need to use the turnback track and cross 16th Street during these critical travel periods, New-MM-TR-1.1 would be implemented to address potential traffic effects. The mitigation measure requires that a traffic/train operation analysis be conducted prior to Caltrain use of the turnback track during the AM/PM peak hours ~~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 New-MM-TR-1.1 ~~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

DTX Alignment Segments with Possible Other Construction Methods. As shown in Figure 2-21, there are two segments evaluated for cut-and-cover construction in the Draft SEIS/EIR that could be constructed using other construction methods – jacked box tunnel at the widened throat structure and

SEM or SEM with tunnel boring machines along Townsend Street (from the Fourth and Townsend Station box to Clarence Place). Although the impacts associated with the construction methods evaluated in the Draft SEIS/EIR would be mitigated to not adverse/less than significant, these other construction methods could lessen the impact construction activities have on air quality in the immediate surrounding area. At the widened throat structure and along Townsend Street, these other construction methods would reduce the amount of air pollutants generated, particularly fugitive dust, since tunnel construction activities would reduce the amount of ground disturbance and the volume of excavated soil materials, and hence reduce the number truck trips required.

- The jacked box tunnel method would involve excavating and constructing the tunnel for a short segment at the Howard Street crossing – approximately 230 feet eastward along Howard Street and 80 feet across Howard Street. The reduction in ground disturbance that results in the generation of fugitive dust would be less, although not substantially different, than the area affected by cut-and-cover construction. As described earlier in Section 2.13 of this Final SEIS/EIR, the use of other mining construction techniques could reduce the volume of soil materials excavated and the number of truck trips needed to remove the materials by about 20 percent, both of which would also lessen the amount of fugitive dust generated by construction activities. Use of heavy machinery to push the boxes into place and to construct and install the roof could increase construction equipment emissions, but they would be located primarily underground, reducing the public's level of direct exposure to the air pollutants generated. Overall, the air emission reductions from this other construction method may be partially offset by the need for additional construction equipment. Regardless, construction air emissions from this relatively short segment would be mitigated by measures adopted in the 2004 FEIS/EIR and incorporated into the proposed project. As a result, the use of the jacked box tunnel method rather than cut-and-cover construction for a portion of the widened throat structure would not result in a new or substantially more severe adverse/significant impact compared to the cut-and-cover method evaluated in the Draft SEIS/EIR.

- SEM would reduce the amount of street surface disruption and the volume of excavated soil materials to be hauled away for the 1,200-foot Townsend Street segment where this construction method could be used instead of cut-and-cover construction. Similar to the discussion above, air pollutants would be reduced because the amount of ground disturbance, the volumes of soil materials generated during excavation, and the number of truck trips would be less compared to the cut-and-cover construction method evaluated in the Draft SEIS/EIR. The reduction of truck trips, however, would be partially offset by the need to deliver materials such as concrete liners for the tunnel. Accordingly, SEM along this segment of Townsend Street would not result in new or substantially more severe construction air quality impacts compared to those reported in the Draft SEIS/EIR. Because the mitigation measures from the 2004 FEIS/EIR have been adopted and incorporated into the proposed project, the construction-related air quality impacts associated with SEM would be not adverse/less than significant.

- The 2017 Tunnel Option Study, as amended, also considered the possibility of using tunnel boring machines where SEM could be used to excavate and construct the tunnel. The addition of tunnel boring machines and the related equipment to deliver and prepare them for use would result in additional construction equipment emissions, but the overall construction duration would also be less with use of the tunnel boring machines. Similar to SEM, the reduction in truck trips due to less excavated materials to be hauled away would result in less air pollutant emissions; however, this reduction in truck trips and related pollutant emissions would be partially offset by the need to deliver materials such as concrete liners for the tunnel and for the set up and equipment required to support the tunnel boring machines. Therefore, the total construction air emissions would not result in new or substantially more severe adverse/significant construction

air quality impacts compared to those construction techniques reported in the Draft SEIS/EIR. Because the mitigation measures from the 2004 FEIS/EIR have been adopted and incorporated into the proposed project, the construction-related air quality impacts associated with SEM with tunnel boring machines would be not adverse/less than significant.

In summary, these other construction methods have the potential of reducing air quality impacts compared to the construction methods evaluated in the Draft SEIS/EIR, although this reduction in truck trips and associated air quality impacts would be partially offset by the need to deliver materials such as concrete liners for the tunnel and for the set-up and equipment required for the various methods. As a result, there would be a localized benefit from reduced construction air emissions, but the overall effect for the entire corridor would remain adverse/significant unless mitigated. Implementation of Mitigation Measures AC 1 through AC 15, which were previously identified in the 2004 FEIS/EIR and adopted and incorporated into the proposed project, in addition to the new Mitigation Measure MM-C-AQ-5.1 (see below) would serve to minimize construction air quality effects of the planned construction method. The determination of which construction method is appropriate for the proposed project will be made following further design and evaluation of the construction methods' cost and schedule implications, constructability, and environmental and public policy considerations.

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~~*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~~*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~~*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.[23]

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):

> 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

[23] California Code of Regulations, Title 13, Division 3, Section 2485.

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.

After release of the Draft SEIS/EIR, the TJPA completed a Tunnel Options Study that identified other construction methods that could be used to excavate and construct the DTX alignment. The intent of the study was to identify construction techniques that could reduce the amount of surface disruption associated with cut-and-cover construction for alignment segments around the widened throat structure and along Townsend Street. As described in Impact C-AQ-5, these other construction methods would reduce air pollutants from ground disturbance, off-hauling of excavated soil materials, and direct exposure to emissions because construction in these segments would occur almost exclusively underground. The jacked box tunnel method that could be used at the Howard Street crossing of the widened throat structure and the SEM or SEM with tunnel boring machines along 1,200 feet of Townsend Street (between Fourth Street and Clarence Place), however, could also increase air emissions, including toxic air contaminants, due to different construction equipment used in these other construction methods. As a result, the other construction methods could result in a localized benefit from reduced TAC emissions, but the overall impacts of TAC emissions for the proposed project would be adverse/significant unless mitigated. The potential health risks due to exposure from construction activities associated with these other construction methods would require the same mitigation measures identified for cut-and-cover construction. With implementation of the mitigation, as described below, these other construction methods would not result in a new or substantially more severe adverse/significant impact due to exposure to toxic air contaminants, compared to those construction methods evaluated in the Draft SEIS/EIR.

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.

2.17 UPDATED SECTION 3.14.2, GREENHOUSE GASES AND CLIMATE CHANGE AFFECTED ENVIRONMENT

Section 3.14.2, Greenhouse Gases and Climate Change Affected Environment, is reproduced below and is amended to acknowledge the rescinding of Council on Environmental Quality guidelines related to greenhouse gases and the effects of climate change in NEPA reviews.

3.14.2 Greenhouse Gases and Climate Change 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[24]

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. In March 2017, after the publication of the Draft SEIS/EIR, the President signed an executive order directing the CEQ to rescind these guidelines.

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]).

[24] In March 2017, this Executive Order was rescinded. Nevertheless, the information is still useful to understanding that the proposed project reduces these emissions and helps fulfill state and other regulations and plans.

- 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.

2.18 UPDATED SECTION 3.17.3, UTILITIES ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 3.17.3, Utilities Consequences and Mitigation Measures, is reproduced below and is amended to reflect other construction methods.

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~~ D of this Final 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 will be 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 site~~s~~ of the ~~two~~ adjacent land developments at the Third and Townsend Streets vent structure is~~, approximately 13,750 square feet and 45,000 square feet, are currently~~ completely paved. The~~se~~ site's redevelopment may require on-site stormwater controls to accommodate new, more intensive development; however, ~~development of these~~ use of this site~~s~~ for a vent structure and adjacent land development 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~~ thi<u>se</u>~~se~~ site~~s~~, based on City zoning, is 72<u>6</u>~~6~~,000 square feet that could generate up to approximately 300 employees (see Table 3.4<u>-</u>~~.~~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.

- The other tunnel construction methods, described in Section 2.4 of this Final SEIS/EIR, would involve underground construction for most of the length of the segments, rather than excavating

from the street level down. Specifically, the jacked box tunnel method at the widened throat structure and SEM or SEM with tunnel boring machines construction techniques along Townsend Street would excavate and construct the tunnel below the underground utility lines, thereby avoiding potential utility conflicts. Since there would be no disturbance at the street level, as with the cut-and-cover construction method, at-grade and above-ground utilities would also remain in place. Consequently, these other methods would reduce potential service interruptions due to utility relocations compared to cut-and-cover construction. The SEM and SEM with tunnel boring machine would likely require grouting or other ground improvement measures in areas of soft ground conditions (such as along Townsend Street) that could damage older and brittle underground utilities and may require utility relocation, or utility replacement prior to ground improvement. However, the previously adopted mitigation measure identified in the 2004 FEIS/EIR (see below) would be implemented as part of the proposed project and reduce the impacts of the ground improvements associated with SEM and SEM with tunnel boring machines to not adverse/less than significant. As a result, these other construction methods would not increase impacts due to utility relocation identified for cut-and-cover construction but could lessen the impacts.

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.

2.19 UPDATED SECTION 3.18, ENVIRONMENTAL JUSTICE COMMUNITIES

Section 3.18, Environmental Justice Communities, is reproduced below and is amended to update the demographic data, refine the analysis to reflect better FTA's 2012 Environmental Justice (EJ) Circular, and reflect revisions to other sections.

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 populations exist~~s~~ 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 general principles of EO 12898 are as follows:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low income populations.

- Ensure the full and fair participation of all potentially affected communities in the transportation decision-making process.

- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income 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, t~~This analysis examines~~focuses on~~ the 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~~ in accordance with CEQ's 1997 *Environmental Justice Guidance under the National Environmental Policy Act* guidance, FTA's 2012 Environmental Justice (EJ) 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, 2018) was reviewed to identify defined or established communities in the study area. For the Draft SEIS/EIR, t~~T~~wo communities were identified, based on the City's 2012 report, that encompass the project area: the Financial District and the South of Market (SoMa) neighborhood. For this Final SEIS/EIR, the City's 2018 report was also

examined; however, changes in the boundaries of the neighborhoods that encompass the project area do not allow direct demographic comparisons. Nevertheless, the neighborhoods in the project area continue to be applicable. The Financial District has been expanded north and south and renamed as the Financial District/South Beach neighborhood but still includes ~~combines~~ the Transit Center area, where the widened throat structure, extended train box, intercity bus facility, and underground pedestrian connector are proposed~~, 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 was reduced in size (with its eastern portion being shifted into the Financial District/South Beach neighborhood) and now extends from Third Street ~~the waterfront~~ on the east to ~~just past~~ Eleventh Street on the west, between Market Street on the north and Townsend~~King~~ Street on the south. This neighborhood still borders the proposed Fourth and Townsend Street Station and the tunnel stub box.~~This diverse neighborhood is 52 percent non-White and 20 percent of the population is below the poverty line.~~ The Mission Bay neighborhood is south of the Financial District/South Beach and South of Market neighborhoods and encompasses the proposed turnback and maintenance-of-way tracks south of the Caltrain railyard.

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 Final 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 Populations~~/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's *Environmental Justice Guidance under the National Environmental Policy Act* December 1997 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. In the Draft SEIS/EIR, ~~C~~consistent with other planning documents for transportation projects in the City and County of San

Francisco,[25] "meaningfully greater" ~~is~~ was assumed to be at least 10 percentage points greater than the citywide percentages of minority or low-income populations.

In this Final SEIS/EIR, the approach was updated to be consistent with FTA's 2012 EJ Circular. The minority and low-income populations within the study area, as defined below, were compared to the City as a whole to ~~determine~~ identify ~~whether~~ where higher percentages of environmental justice populations exist in the study area. While the assessment of meaningfully greater percentages of environmental justice populations is helpful to understanding the demographic composition of the study area relative to the City, FTA's 2012 EJ Circular makes the point that a small minority or low-income population does not eliminate the possibility of disproportionately high and adverse impacts, so that all minority and low-income populations need to be identified along with impacts to those populations. Therefore, this analysis characterizes the demographic composition of the corridor as well as presents the EJ populations consistent with 1997 CEQ guidance.

Study Area for Environmental Justice

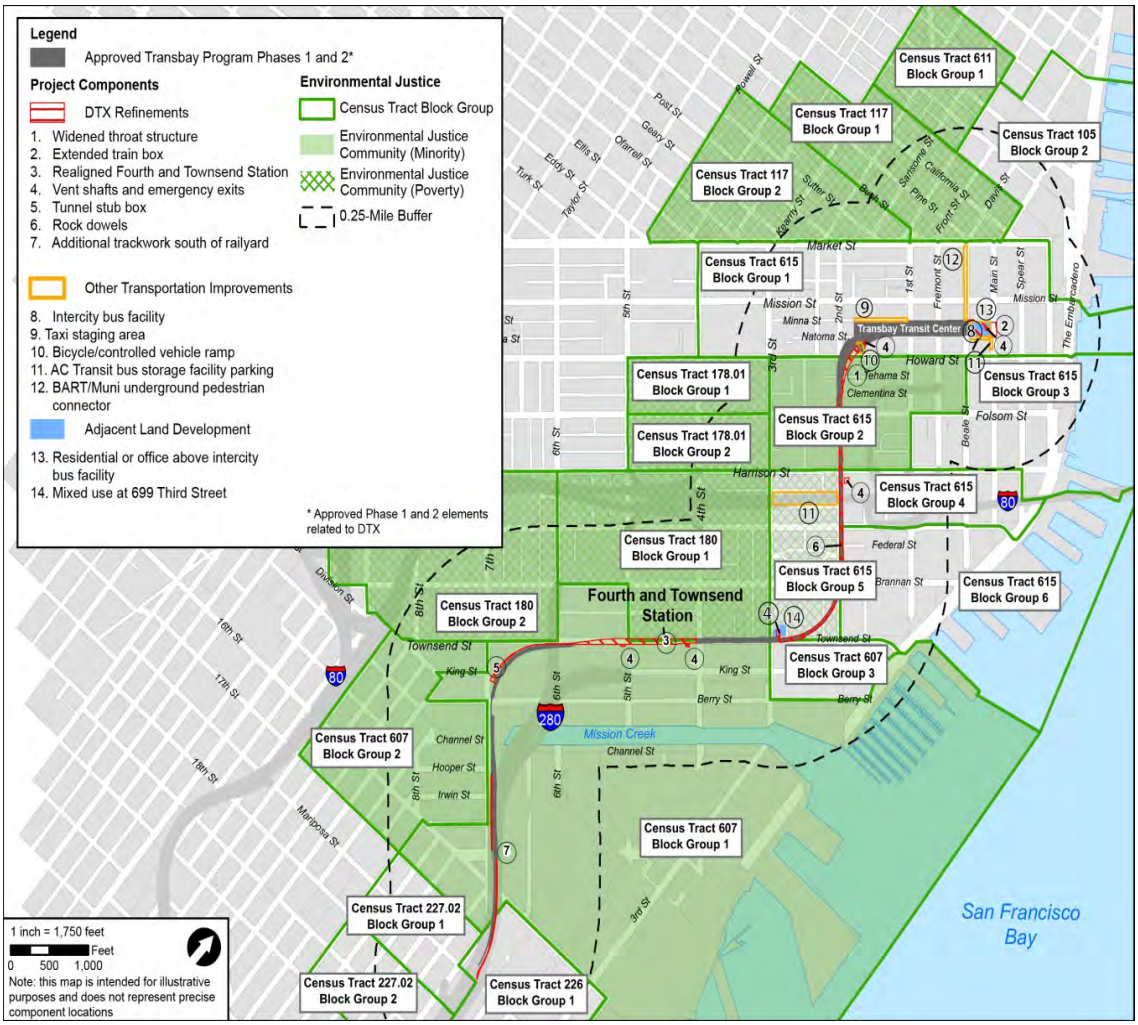
For purposes of this analysis, the study area is defined to include all census tract block groups within 0.25 mile[26] of each of the proposed project components. If any part of a census tract block group intersects the study area, it is included in this analysis. Data for the entire census tract block 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 EJ~~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.

~~[25] 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.~~

[26] 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 EJ~~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 EJ~~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, 2018), 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 EJ~~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.

Each group responded positively to being informed about the project and requested information as the project progressed. None, however, identified any other EJ groups or organizations that should be consulted during the environmental review process. 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.

During the public review and comment period for the Draft SEIS/EIR, one commenter identified concerns that future residential development that could occur above the proposed intercity bus facility may include EJ populations that could be at risk due to harmful environmental effects, such as air quality and noise, associated with bus ingress, egress, and idling. The comment letter (coded as "FR") and response are provided in Appendix A of this Final SEIS/EIR. The updated analysis provided in this section of the Final SEIS/EIR also contains additional information about potential EJ impacts associated with residential development that could co-locate with this and other proposed project transportation improvements.

Minority Populations~~Race and Ethnicity~~

Table 3.18-1 and Figure 3.18-1 show~~s~~ the percentage of ~~ethnic and racial~~ minority populations by census tract and block group within the study area. The Draft SEIS/EIR relied on data from the 2010 Census. Updated information from the American Community Survey for 2011-2016 has been included in Table 3.18-1 to provide a more current overview to population in the project area. Based on the 2010 data, s~~S~~even census tract block groups had~~ve ethnic and racial~~ minority populations greater than 50 percent~~.~~; in 2016, three additional census tract block groups had minority populations greater than 50 percent of the block groups' total population.

Census tracts 226, and 227.02 have the lowest percentages of minority populations along the corridor, and include areas in the southwestern portion of the project corridor around Mission Bay South. Areas with a high percentage of minority populations along the corridor include census tracts 117, 178.01, 180, 607,

611, and portions of 615. These areas with higher percentages of minority populations are described below.

- Census tract 117 encompasses the heart of the Financial District, but extends west to include older multifamily buildings between Powell and Kearney Streets in the Downtown and Nob Hill neighborhoods, north of Market Street. Many of the students attending the Academy of Art University find housing in this area. Residents in this census tract are more than 0.25 mile from any of the project components.

- Census tracts 178.01 and 180 are in the heart of SoMa, within an area also known as Yerba Buena, and have a historical and cultural connection to the City's Filipino community. Within 0.25 mile to the east is the DTX alignment along Second Street and to the southeast is the AC Transit bus storage facility where off-hours public parking is proposed as part of the project.

- Census tract 607 includes portions of two neighborhoods. As seen in Figure 3.18-1, block group 1 is almost entirely east of Seventh Street and I-280 and lies within the large Mission Bay area. Most of the residents in this block group live in new high-rise residential complexes along the south side of Townsend Street between Third and Fourth Streets, and relatively recent (within the past 20 years) high-rise developments along Berry Street north of Mission Creek between Seventh Street/I-280 on the west and AT&T Park on the east. Other residents in the Mission Bay North neighborhood are part of a houseboat community that live along the south side of Mission Creek. Residents in this area of Mission Bay are separated from the proposed project by the Caltrain railyard. At the western end of the census tract (on the west side of I-280) in the northeast corner of the Potrero Hill neighborhood, there are new mid-rise residential buildings amidst industrial buildings.

  The second neighborhood is within census tract 607 block group 2, west of Seventh Street to I-80. This area includes new housing close to the Caltrain alignment along Seventh Street, and a mix of mid-rise housing, offices, and warehouses further to the east, in a portion of the SoMa neighborhood known as the "Design District" and more than 0.25 mile from the proposed project.

- Census tract 611, of which only a small fraction lies within 0.25 mile of any project component, includes residential units above ground-floor retail or offices in a small area within the northern portion of the Financial District and Jackson Square, and bounded by Chinatown to west and The Embarcadero to the east.

- Census tract 615, particularly block group 2, lies within the Transbay Redevelopment Plan area, and is immediately south of the Transit Center. Residents of this area occupy modern high-rise residential towers that have been constructed with the planned transformation of this area around the Transit Center. Projects that have been constructed as part of the Redevelopment Plan encourage the inclusion of affordable housing units. This census tract block group straddles the Second Street alignment of DTX and is proximate to several project components, including the widened throat structure, the extended train box, and the intercity bus facility.

The City and County of San Francisco as a whole has a~~n ethnic and racial~~ minority population of 52~~5~~ 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~~ Percentage of Minorities by Census Tract Block Group in 2010 and 2016

Census Tract	Block Group	~~Ethnic and Racial~~ 2010 Minority (%)	2016 Minority (%)	EJ Community 2010/2016[a]	Relevant Project Component[b]
Census Tract 105	Block Group 2	31	45	No	Near #2, 4, 9, 10, 13
Census Tract 117	Block Group 1	69	**60**	**Yes**	Adjacent to #13; Near #2, 4, 9, 10, 14
	Block Group 2	59	**58**	**Yes**	Near #1, 2, 4, 9, 10, 11, 13, 14
Census Tract 178.01	Block Group 1	84	**85**	**Yes**	Near #1, 4, 6, 10, 11, 12
	Block Group 2	65	**60**	**Yes**	Near #1, 4, 6, 10, 11, 12
Census Tract 180	Block Group 1	46	**53**	No / **Yes**	Adjacent to #3, 4, 7, 12, 16; Near #1, 6
	Block Group 2	60	**57**	**Yes**	Adjacent to #5; Near #3, 4
Census Tract 226	Block Group 1	27	27	No	Encompasses #8
Census Tract 227.02	Block Group 1	25	24	No	Adjacent to #8
	Block Group 2	27	23	No	Near #8
Census Tract 607	Block Group 1	54	**61**	**Yes**	Encompasses #3, 4, 5, 8; Adjacent to #7, 16; Near #6
	Block Group 2	44	**73**	No / **Yes**	Adjacent to #8; Near #5
	Block Group 3	38	32	No	Adjacent to #6, 7, 16; Near #3, 4
Census Tract 611	Block Group 1	85	**87**	**Yes**	Near #13
Census Tract 615	Block Group 1	40	47	No	Encompasses # 1, 2, 4, 9, 10, 11, 13, 14; Near #6, 12
	Block Group 2	43	**57**	No / **Yes**	Encompasses #1, 6; Adjacent to 11; Near 2, 4, 9, 10, 13, 14
	Block Group 3	49	48	No	Near #1, 2, 4, 6, 9, 10, 11, 12, 13, 14
	Block Group 4	42	46	No	Encompasses #4; Adjacent to #6, 12; Near #1
	Block Group 5	44	45	No	Encompasses #7, 12, 16; Adjacent to #6; Near #1, 3, 4, 10, 11
	Block Group 6	39	38	No	Adjacent to #6; Near #4, 7, 12, 16
City and County of San Francisco		55	52		

Note:
[a] EJ = environmental justice; EJ population identified when the percentage of ~~ethnic and racial~~ minority in a census block is greater than 50 percent, consistent with CEQ's *Environmental Justice Guidance under the National Environmental Policy Act*.
[b] Refer to Figure 3.18-1 for identification of project components within, adjacent to, or near the block group.
Source: U.S. Census Bureau 2010; U.S. Census Bureau 2016a

Poverty Status

Consistent with 1997 CEQ guidance, the Draft SEIS/EIR reported census tracts with a percentage of households living below the poverty line at least 10 percentage points higher than the countywide average. 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 was ~~is~~ 12 percent. Census tract~~s~~ 117 (block group 2), census tract 178.01 (block group 1), and census tract 611 (block group 1) had~~ve~~ percentages of households living below the poverty line ~~at least 10 percentage points higher than the countywide average (Table 3.18-2)~~ that resulted in their identification as EJ communities.

For this Final SEIS/EIR, the poverty information has been updated in accordance with FTA's 2012 EJ Circular that defines low-income populations as those with incomes below 150 percent of the poverty line as defined by the U.S. Department of Health and Human Services (HHS). The HHS poverty line is defined for the U.S., without accounting for regional variations in wages and cost of living. To reflect regional differences and account for incomes at the census block group level, information from the American Community Surveys is used in this analysis. In 2016, low-income populations (i.e., below 150 percent of the poverty line) occur in eight census tract block groups in the project area as shown in Table 3.18-2 and Figure 3.18-1. The percentage of the population in the City and County of San Francisco below 150 percent of the poverty line was 19 percent in 2016, the most current year of data. Census tracts 226, 227.02, 607, and most of 615 have the lowest percentages of low-income populations along the corridor, and include the southern portion of the project area around and in Mission Bay South and south of Market Street in the Transbay Redevelopment Plan area. Areas with a high percentage of low-income populations along the corridor are census tracts 117, 178.01, 180, 611, and a portion of 615.

A general description of these areas with low-income EJ populations is presented below.

- Census tract 117 residents are more than 0.25 mile from any of the project components, and typically occupy older multifamily buildings in the Downtown and Nob Hill neighborhoods. As stated above, there is a large population of students in this general area.

- Census tracts 178.01 and 180 contain residents of the Filipino community and live/work spaces. This area is home to several large affordable and/or senior housing developments such as the Alexis Apartments and the Ceatrice Polite Apartments along Clementina Street, Woolf House on Howard Street, and the San Lorenzo Ruiz Center on Rizal Street. Residents of census tract 178.01 would be within 0.25 mile of the DTX alignment and the AC Transit bus facility that would be available for public parking during certain hours. Residents of census tract 180 border Townsend Street, and would be adjacent to the AC Transit bus facility, proposed vent structures, the Fourth and Townsend Street Station, and the tunnel stub box.

- Census tract 611 is barely within the study area, and residents are most likely concentrated at its northern end (farthest from the project study area) where the census tract abuts Chinatown.

- Census tract 615, and specifically block group 5, is located in the far eastern portion of the SoMa neighborhood and includes an older residential neighborhood around South Park mixed with new multi-story residences that provides housing for design professionals and the City's Web-related companies in the larger SoMa area. Residents in this area are generally in the northern portion of census tract, which is bounded on the east by the underground DTX alignment along Second Street. The AC Transit bus parking facility and the Third and Townsend vent structure would be within this census tract.

Table 3.18-2
Population Under the Poverty Level by Census Tract Block Group, 2007–2011 and 2016

Census Tract	Block Group	1997 CEQ Guidance: Population Under Poverty Line (%)	2012 EJ Circular: % of Population below 150% of Poverty Line	EJ Community 2012/2016[a]	Relevant Project Component[b]
Census Tract 105	Block Group 2	10	12	No	Near #2, 4, 9, 10, 13
Census Tract 117	Block Group 1	10	**26**	No / **Yes**	Adjacent to #13; Near #2, 4, 9, 10, 14
	Block Group 2	35	**30**	**Yes**	Near #1, 2, 4, 9, 10, 11, 13, 14
Census Tract 178.01	Block Group 1	42	**75**	**Yes**	Near #1, 4, 6, 10, 11, 12
	Block Group 2	14	**33**	No / **Yes**	Near #1, 4, 6, 10, 11, 12
Census Tract 180	Block Group 1	19	**26**	No / **Yes**	Adjacent to #3, 4, 7, 12, 16; Near #1, 6
	Block Group 2	14	**25**	No / **Yes**	Adjacent to #5; Near #3, 4
Census Tract 226	Block Group 1	0	7	No	Encompasses #8
Census Tract 227.02	Block Group 1	6	4	No	Adjacent to #8
	Block Group 2	1	4	No	Near #8
Census Tract 607	Block Group 1	8	15	No	Encompasses #3, 4, 5, 8; Adjacent to #7, 16; Near #6
	Block Group 2	5	0	No	Adjacent to #8; Near #5
	Block Group 3	9	7	No	Adjacent to #6, 7, 16; Near #3, 4
Census Tract 611	Block Group 1	29	**49**	**Yes**	Near #13
Census Tract 615	Block Group 1	4	3	No	Encompasses # 1, 2, 4, 9, 10, 11, 13, 14; Near #6, 12
	Block Group 2	13	9	No	Encompasses #1, 6; Adjacent to 11; Near 2, 4, 9, 10, 13, 14
	Block Group 3	6	16	No	Near #1, 2, 4, 6, 9, 10, 11, 12, 13, 14
	Block Group 4	7	4	No	Encompasses #4; Adjacent to #6, 12; Near #1
	Block Group 5	12	**55**	No / **Yes**	Encompasses #7, 12, 16; Adjacent to #6; Near #1, 3, 4, 10, 11
	Block Group 6	18	14	No	Adjacent to #6; Near #4, 7, 12, 16
City and County of San Francisco		12	19		

Note:
[a] EJ = environmental justice; per 1997 CEQ guidance used in the Draft SEIS/EIR, 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; in this Final SEIS/EIR, EJ population identified when the percentage of population below 150 percent of the poverty line is greater than the countywide percentage of 19 percent.
[b] Refer to Figure 3.18-1 for identification of project components within, adjacent to, or near the block group.
Source: U.S. Census Bureau 2012; U.S. Census Bureau 2016b

~~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, the corridor includes a concentration of EJ~~environmental justice~~ communities ~~census tract block groups are~~ in the study area. Ten~~Seven~~ census tract block groups include ~~would be defined as ethnic~~ minority communities greater than 50 percent of the total population and eight~~three~~ census tract block groups have~~are~~ a higher percentage of low-income communities (i.e., below 150 percent of the federally identified poverty level) than the City and County of San Francisco. These EJ~~environmental justice~~ communities are shown in Figure 3.18-1, along with the proposed project components.

Figure 3.18-1 shows that the majority of the project corridor and study area includes EJ communities. The few areas within the project area without higher concentrations of minority and /or low-income populations include the area immediately around the Transit Center and to the southeast in the South Beach neighborhood along The Embarcadero (census tract 615 block groups 1, 3, 4, and 6, and census tract 607 block group 3), and the far southwest corner of the area near the proposed trackwork south of the Caltrain railyard, which is within the Potrero Hill neighborhood on the west side of I-280 and Mission Bay on the east side of the freeway (census tracts 227.02 and 226).

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]).

FTA's 2012 EJ Circular Environmental Justice Policy Guidance for Federal Transition Administration Recipients

The guidance identifies methods for determining the presence of an environmental justice population, defines disproportionately high and adverse effects, and provides direction to determine whether adverse effects will be borne by environmental justice populations. With respect to incorporating environmental justice in the NEPA analysis, the circular explains that determinations of disproportionately high and

adverse effects should take into account mitigation and enhancement measures that would lessen and possibly minimize the adverse effects. The analysis of effects on EJ populations should also balance the high and adverse effects against the offsetting benefits to the affected minority and low-income populations and to the community as a whole.

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, there is no threshold for significance as it pertains to EJ populations; however, 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 with the consideration of mitigation measures and off-setting benefits of a proposed action.

- 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 EJ~~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 EJ~~environmental justice~~ community.

The proposed project would have a potentially significant impact under CEQA 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)

In the Draft SEIS/EIR, ~~S~~seven environmental justice communities ~~are present~~were identified in the vicinity of the proposed project. Based on FTA's 2012 EJ Circular used for this Final SEIS/EIR, there are ten census tract block groups with higher concentrations of minority and/or low-income populations. ~~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 EJ~~environmental justice~~ communities. EJ~~Environmental justice~~ analysis requires a comparative analysis of impacts on EJ and non-EJ populations and a balancing of disproportionate impacts on minority and low-income populations with the potential benefits of the proposed project; this assessment is presented below and summarized in Table 3.18-3.

~~Effects/Impacts by~~ Resource Topics with No Adverse Effects. For the following resource areas, no adverse effects were identified and no adverse impacts would occur on any population, including EJ~~environmental justice~~ communities, in the study area: Land Use and Planning; Socioeconomics, Population, and Housing; Visual Quality/Aesthetics; ~~Geology, Soils, and Seismicity;~~ Hazardous Materials; Greenhouse Gas and Climate Change; Public Services, Community Services, and Recreational Facilities; ~~and~~ Safety and Security; and Utilities. Therefore, there would be no disproportionately high and adverse effects on EJ populations under these resource areas.

Resource Topics with Mitigated Adverse Effects. Resource areas that may have adverse impacts ~~that would be reduced with~~ prior to the implementation of avoidance, minimization, and/or mitigation measures are Transportation; ~~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 associated with project operations; and Air Quality~~; and Utilities~~. A discussion of the adverse effects identified for these resource areas, as they affect EJ and non-EJ populations, is provided below and in Table 3.18-3.

- Adverse *transportation effects* are localized and result from the additional trackwork south of the Caltrain railyard, as described in Section 3.2, Transportation, of the Draft SEIS/EIR. Specifically, the at-grade crossing of the additional tracks at 16th Street may result in future additional traffic delays and circulation impacts during the AM/PM peak hours if Caltrain decides it needs to move trains along the turnback track during these critical commute hours, and would increase the width of the intersection resulting in potential safety concerns for pedestrians and bicyclists crossing the street.

  As shown in Figure 3.18-1, this at-grade crossing (identified as Project Component #7) is flanked on either side by census tract 607 block group 1, identified as a minority EJ community. To the east of the crossing, there are no residences that would be directly affected since the EJ population on the east side of block group 1 is more than 0.25 mile to the north and east of this project component. To the west, within this same block group, there are new luxury apartments at Potrero 1010 and market-rate loft apartments in the Design District of the SoMa neighborhood that front onto Seventh Street and the Caltrain tracks. Also north and west of the at-grade crossing, there is another minority EJ community within census tract 607 block group 2.

Residents of this block group are also within the Design District and are interspersed with offices, retail spaces, and warehouses, extending west to U.S. Highway 101. However, they may be affected by the at-grade crossing because streets in this area feed into 16th Street. Finally, just to the south of the at-grade crossing, there are two other census tracts that are part of the Potrero Hill neighborhood with percentages of minority populations that are less than half of the citywide figure of 52 percent. These non-EJ census tract block groups are important to mention because streets from these areas feed directly into the proposed at-grade crossing, and residents from these areas would be similarly affected as other nearby residents from census tracts with high percentages of minority EJ populations.

Because the area around this project component is predominantly high minority populations, the adverse traffic effect would be predominantly borne by EJ populations in the Mission Bay neighborhood east of the intersection and in the Design District of the SoMa neighborhood west of the intersection. However, because 16th Street provides access to Mission Bay, which includes several medical centers, new businesses, and an under-construction basketball arena/event center, it serves EJ and non-EJ communities throughout the City. The Mission Bay area is a citywide destination for medical services, jobs, and entertainment, so that travel along 16th Street, which is a primary access route used by automobiles and transit, and the potential delays and safety considerations at the at-grade crossing would be similar in nature and magnitude for both EJ and non-EJ communities. As a result, the proposed project would not be expected to result in adverse effects that would be appreciably more severe or greater in magnitude for EJ populations than for non-EJ populations.

Alternatives to the at-grade crossing (including grade separating the railroad tracks from the streets) were previously addressed in the Peninsula Corridor Electrification Project EIR (Peninsula Corridor Joint Powers Board 2015) and determined to be prohibitively costly with greater potential impacts. Nevertheless, following implementation of the mitigation measures proposed in this Final SEIS/EIR, the transportation impacts for both EJ and non-EJ populations would be reduced to not adverse/less than significant. The mitigation measure proposed at the at-grade crossing (i.e., modify the intersections as necessary in the future to achieve specified operational and safety standards) would apply similarly for both EJ and non-EJ communities. Because there would be no adverse effect after application of the mitigation measures, there would be no disproportionately high and adverse effect to EJ populations.

- Adverse *cultural resource effects* are associated with construction activities that could disturb paleontological resources, as described in Section 3.6, Historic and Cultural Resources, of the Draft EIS/EIR. This potential effect could occur anywhere along the project corridor where ground disturbance would occur. Project components involving ground disturbance include the widened throat structure (Project Component #1 in Figure 3.18-1), the extended train box (Project Component #2), the realigned Fourth and Townsend Street Station (Project Component #3), the vent structures (Project Component #4), the tunnel stub box at the Caltrain railyard (Project Component #5), and the underground pedestrian connector (Project Component #12).

  The potential to disturb paleontological resources would not alter directly human health or environmental effects such as social or economic effects for populations along the corridor. Nevertheless, the loss of these resources would be a disruption to natural resources which is a relevant consideration for an EJ analysis. As seen in Figure 3.18-1, the project components involving ground disturbance cover most of the project corridor. Construction would take place almost entirely underground within the public rights-of-way, and the potential to discover unknown unique paleontological resources could occur anywhere along the corridor. Because a majority of the corridor that would involve ground disturbance during construction passes

through or along EJ populations, the effects of uncovering such resources would be borne predominantly by minority populations and/or low-income populations. However, the loss of paleontological resources would be similar in nature and magnitude in both EJ and non-EJ communities, so that the proposed project not result in appreciably more severe or greater in magnitude paleontological impacts for EJ populations compared to non-EJ populations.

Following implementation of the mitigation measure proposed in this Final SEIS/EIR, the impacts to paleontological resources would be reduced to not adverse/less than significant in both EJ and non-EJ communities. The same type, level, and quality of mitigation during construction would be applied in both EJ and non-EJ communities (i.e., construction worker training and cessation of construction if fossils are encountered). Because there would be no adverse effect after application of the mitigation measure, there would be no disproportionately high and adverse effect to EJ populations.

- Adverse *biological resource* effects are associated with construction activities that may disturb nesting birds in street trees. Section 3.7, Biological Resources, of the Draft SEIS/EIR identifies mature landscaping in the vicinity of four proposed project components: around the extended train box at the east end of the Transit Center (Project Component #2 in Figure 3.18-1), along the south side of Townsend Street at the Caltrain railyard (adjacent to Project Component #3), at the AC bus storage facility (Project Component #11), and the underground pedestrian connector along Beale Street (Project Component #12).

  Two project components (the extended train box and underground pedestrian connector) are in the Transbay Redevelopment Plan area (census tract 615 block group 1), which does not have high percentages of EJ populations. In contrast, the AC bus storage facility is near the South Park neighborhood within SoMa (census tract 615 block group 5) with low-income EJ populations, and the Fourth and Townsend Street Station is along the border of the Mission Bay North neighborhood (census tract 607 block group 1) with minority EJ populations and the Design District of the SoMa neighborhood (census tract 180 block group 2) with both minority and low-income EJ populations. Within these EJ communities, the trees that could support nesting birds are adjacent to residences.

  The biological effects due to loss of vegetation and trees along the project corridor would not alter directly human health or environmental effects such as social or economic effects for populations along the corridor. Nevertheless, the loss of these resources would be a disruption to natural resources which is a relevant consideration for an EJ analysis. Given the location of residents in the EJ and non-EJ neighborhoods relative to the trees that may provide habitat for nesting birds, the potential loss of nesting birds due to construction activities would not be predominantly borne by a minority population and/or low-income population (i.e., EJ populations are near the trees at two of the project components; non-EJ populations are in the vicinity of the trees at the other two project components). Furthermore, construction projects throughout the City (e.g., the bus and bicycle improvements associated with Muni Forward and the City Bike Master Plan, the recent new hospital construction and expansions at California Pacific Medical Center, city streetscape and road improvements along Second and Sixth Streets, and the Van Ness Bus Rapid Transit Project), in both EJ and non-EJ communities, are required to protect nesting birds as mandated by the federal Migratory Bird Treaty Act and by the state Fish and Game Code. Consequently, the potential to disturb nesting bird exists throughout the City. Because the loss of trees that support nesting birds would be similar in nature and magnitude in both EJ and non-EJ communities, the proposed project would not result in adverse biological effects that would be appreciably more severe or greater in magnitude for EJ populations than for non-EJ populations.

Moreover, following implementation of the mitigation measures proposed in this Final SEIS/EIR, the impacts to nesting birds would be reduced to not adverse/less than significant in both EJ and non-EJ communities. The same type, level, and quality of mitigation during construction (i.e., preconstruction surveys, followed by standard avoidance measures if nesting birds are identified) would be applied in both EJ and non-EJ communities. Because there would be no adverse effect after application of the mitigation measures already included as part of the project, there would be no disproportionately high and adverse effect to EJ populations.

- Adverse *water resources/water quality effects* result from flood hazards and sea-level rise. Section 3.8, Water Resources and Water Quality, of the Draft SEIS/EIR (Figures 3.8-1 through 3.8-4) identifies areas subject to inundation under different scenarios. Proposed project components that lie within areas vulnerable to flood hazards include the eastern end of the Transit Center (i.e., the extended train box and the intercity bus facility [Project Components #2 and #8, respectively, in Figure 3.18-1]) and those improvements between Fourth and Seventh Streets on either side of Townsend Street (i.e., the realigned Fourth and Townsend Street Station, the tunnel stub box, and the additional trackwork south of the Caltrain railyard [Project Components #3, #5, and #7, respectively]). The census tract block group at the east end of the Transit Center is in Transbay Redevelopment Plan area and not an EJ community (census tract 615 block group 1). The census tract block groups along Townsend Street and extending south along Seventh Street are a mix of EJ and non-EJ communities in SoMa, Mission Bay North, and lower Potrero Hill (census tract 180 block groups 1 and 2 and census tract 607 block group 1 are EJ communities, while census tract 226 block group 1 is not).

  Although individual project components in EJ and non-EJ communities may not be exposed to flood hazard impacts, the extent of the flood risk zones shown in Figure 3.8-2 indicates more than half of the project corridor would be vulnerable to inundation. The potential impacts of flooding are not a result of the proposed project, and the proposed project would not exacerbate flood conditions. Because these communities would be exposed to flood hazards with or without the project, the proposed project would not result in flood risks that would be predominantly borne by a minority population and/or a low-income population. Similarly, because the flood hazards impacts are not a result of the project, it would not result in adverse effects that would be appreciably more severe or greater in magnitude for EJ populations than for non-EJ populations.

  Moreover, following implementation of the mitigation measures proposed in this Final SEIS/EIR, the flood impacts from 100-year storms, which could include damage to the transit system and endangerment to passengers, would be reduced to not adverse/less than significant. The same type, level, and quality of mitigation would be applied in both EJ and non-EJ communities (i.e., the design of project facilities in flood hazard areas would maintain sufficient protection to avoid inundation of station entrances and other points of access to below-ground portions of the DTX system). Because there would be no adverse effect after application of the mitigation measures, there would be no disproportionately high and adverse effect to EJ populations.

- Adverse *geology effects* could result from project construction in areas with groundwater which can lead to settlement of adjacent properties, as described in Section 3.9, Geology, Soils, and Seismicity, of the Draft SEIS/EIR. These potential effects are identified in segments of the corridor where the cut-and-cover construction method would be used or where the sequential excavation method would be used in segments with soft ground conditions.

  Project components that would be constructed using the cut-and-cover construction method include the widened throat structure (Project Component #1 in Figure 3.18-1), the extended train box (Project Component #2), the realigned Fourth and Townsend Street Station (Project

Component #3), the vent structures (Project Component #4), the tunnel stub box at the Caltrain railyard (Project Component #5), and the underground pedestrian connector (Project Component #12). The cut-and-cover construction method is proposed for the soft ground conditions along Townsend Street, generally between Third and the Fourth Streets, but the sequential excavation method is another construction technique that is also being considered.

As seen in Figure 3.18-1, these project components cover most of the project corridor. Construction would occur almost entirely underground within the public rights-of-way and the potential to encounter groundwater could anywhere along these segments. More specifically, a portion of the widened throat structure, the extended train box, and the underground pedestrian connector would be in the northern portion of the Transbay Redevelopment Plan area census tract 615 block group 1), where there are relatively few minority or low-income populations near any of these project components. By contrast, a portion of the widened throat structure, the realigned Fourth and Townsend Street Station, the tunnel stub box, and the block along Townsend Street that could be constructed using the sequential excavation method are within EJ communities in the SoMa neighborhood (census tract block group 2, census tract 615 block group 5, census tract 180 block groups 1 and 2) and the Mission Bay North neighborhood (census tract 607 block group 1). Based on the extent of construction in these areas with EJ populations and the proximity of the residences to the areas of construction compared to the location of the non-EJ residences, the geology effects would be predominantly borne by minority and/or low-income populations. Furthermore, because there are residences that front directly onto Townsend Street between Third and Sixth Streets, the proposed project could result in settlement impacts that would be appreciably more severe and greater in magnitude for EJ populations than for non-EJ populations.

The 2004 FEIS/EIR identified mitigation measures to reduce settlement effects to not adverse/less than significant. Because the 2004 FEIS/EIR mitigation measures were adopted and have been incorporated into the proposed project and additional measures are identified in this Final SEIS/EIR to more specially mitigate potential settlement effects where groundwater would be encountered, the geology impacts from project construction would be not adverse/less than significant. The same type, level, and quality of mitigation during construction would be applied in both EJ and non-EJ communities (i.e., implement groundwater control measures based on groundwater levels). With no adverse effects to any population due to project construction where groundwater may be encountered, there would be no disproportionately high and adverse effect to EJ populations.

- Adverse *electromagnetic field impacts* are identified in Section 3.11, Electromagnetic Fields, of the Draft SEIS/EIR. The impacts result from the turnback track (Project Component #7 in Figure 3.18-1), which would shift future overhead electric lines that will be used by Caltrain (once the system is electrified) closer to businesses and medical facilities in the Mission Bay area that may have sensitive medical and/or research electronic equipment onsite. This potential impact would affect nearby businesses, and residents would not be adversely affected since the trackwork would shift the overhead lines further from the residences. There are existing residences in the vicinity within minority EJ areas (census tract 607 block groups 1 and 2); however, those on the east side of the realigned electric lines are more than 0.25 mile to the north and east, and those on the west side would be further removed from the electric lines since the lines would be realigned eastward away from these residences. As a result, electromagnetic impacts would not be predominantly borne by a minority population and/or a low-income population. Furthermore, because there are no impacts to populations along this project component, the proposed project would not result in adverse electromagnetic effects that would be appreciably more severe or greater in magnitude for EJ populations than for non-EJ populations. With no adverse effects to

any population due to this project component, there would be no disproportionately high and adverse effect to EJ populations.

- Adverse *operational noise impacts* are described in Section 3.12 of the Draft SEIS/EIR. Project components that could result in exposure to excessive noise levels include the vent structures. Vent structures (Project Component #4 in Figure 3.18-1) are proposed at both ends of the Transit Center, at Second and Harrison Streets, at Third and Townsend Streets, and at both ends of the Fourth and Townsend Street Station. As shown in Figure 3.18-1, the vent structures at the Fourth and Townsend Street Station and at Third and Townsend Streets would be sited adjacent to the Yerba Buena area of the SoMa neighborhood to the north and the Mission Bay North neighborhood to the south (census tract 180 block group 1 and census tract 607 block group 1, respectively), each with high concentrations of EJ populations. The vent structures at the Transit Center and at Second and Harrison Streets are in non-EJ communities.

  Noise impacts from vent structures attenuate rapidly with distance from the source. As described in Section 3.12 of the Draft SEIS/EIR, at 30 feet from the shaft gratings, noise levels would range from 60 to 70 dB. At 60 feet, noise levels could be expected to reduce by at least 3 dB. At this attenuation rate and the distance of the proposed vent structures to the existing residences (the closest residence is approximately 80 feet away), there would not be an adverse noise impact. As a result, noise impacts from the vent structures would not be predominantly borne by a minority population and/or a low-income population. Also, because the effects would be similar in nature and magnitude in both EJ and non-EJ populations, the proposed project would not be expected to result in appreciably more severe or greater in magnitude adverse operational noise effect for existing EJ populations than non-EJ populations.

  Furthermore, following implementation of the mitigation measure proposed in this Final SEIS/EIR, the noise impacts from the operation of the vent structures and the testing of the associated emergency generators would be reduced to not adverse/less than significant. The same type, level, and quality of mitigation would be applied in both EJ and non-EJ communities (i.e., install noise abatement measures to achieve a specified noise standard). With no adverse effect after mitigation, there would be no disproportionately high and adverse operational noise effect to EJ populations.

- Adverse *operational air quality impacts* are identified in Section 3.13 of the Draft SEIS/EIR. Populations that could experience the adverse health risks from operation of the proposed intercity bus facility (Project Component #8 in Figure 3.18-1) and from operation of the vent structures and their related emergency generators (Project Component #4) include existing residents and a daycare facility in the vicinity of the proposed intercity bus facility and residents near the proposed vent structure sites. The potential health risks from these facilities, as evaluated in Section 3.13, are exposure to PM2.5 and increased cancer risk.

  The intercity bus facility and the vent structures at the Transit Center would be within the northern portion of Transbay Redevelopment Plan area, which is not an EJ community. The vent structure sites at Second and Harrison Streets and at Third and Townsend Streets would be located within or adjacent to residents in the low-income EJ communities around the South Park portion of the SoMa neighborhood and southern portion of the Transbay Redevelopment Plan area neighborhood (census tract 615 block group 5 and census tract 615 block group 2). The vent structure sites at the Fourth and Townsend Street Station would be surrounded by minority EJ populations to the south in the Mission Bay North neighborhood and by minority and low-income EJ populations to the north in the SoMa neighborhood.

The impact analysis in Section 3.13 reports that emissions associated with the proposed intercity bus facility would not result in adverse air quality or health risks. However, air emissions from the vent structures and the associated emergency generators could result in health risks. Based on the number (four) and location (immediately adjacent to residences) of vent structures proposed in EJ communities compared to the number (two) and location (not immediately adjacent to residences) in non-EJ communities, the air quality impact and health risks would be predominantly borne by a minority population and/or a low-income population. Moreover, because the vent structures within the EJ neighborhoods are adjacent to or close to the residences (whereas, the vent structures within the non-EJ communities are surrounded by businesses and more distant from residences), the proposed project would result in EJ populations experiencing more severe and greater in magnitude adverse effects than non-EJ populations.

The Final SEIS/EIR proposes mitigation measures to protect populations from emissions and health risks related to vent structures that would lessen the effects to not adverse/less than significant. The same type, level, and quality of mitigation would be applied in both EJ and non-EJ communities (i.e., equip diesel generators with engines that meet specified emission standards). With no adverse effect following implementation of the mitigation measures, there would be no disproportionately high and adverse impact to EJ populations.

- Adverse *construction air quality impacts* would also occur throughout the project corridor. Fugitive dust and construction equipment emissions would result in localized air quality impacts similar to other larger construction projects, such as the Central Subway and Van Ness Bus Rapid projects. The construction activities that would most likely generate these types of emissions would be along segments proposed for the cut-and-cover construction technique and at the staging areas where construction materials, equipment, and personnel would be stored or moved underground to construct the tunnel sections. These areas occur along Second Street within the Transbay Redevelopment Plan area (census tract 615 block group 2), along Townsend Street in the Yerba Buena area along the southern border of SoMa, including a diverse community of Filipinos, live/work artists, and high-tech employees (census tract 180 block group 1), and along Townsend Street in the northern border of the Mission Bay North neighborhood, including high-rise towers and the houseboat community (census tract 607 block group 1). Each of these areas includes high percentages of minority and low-income EJ populations.

  Because the areas where the cut-and-cover construction and staging activities would occur have high percentages of minority and low-income populations, the adverse air quality effects would be predominantly borne by EJ populations. However, cut-and-cover construction and use of staging areas is common throughout the City and is associated with both large and small projects. Street repairs, the Central Subway, and the San Francisco Public Utilities Commission's water supply and wastewater system improvements use this common construction method throughout the City in EJ and non-EJ communities. Because the construction air quality effects would be similar in nature and magnitude in both EJ and non-EJ communities, the proposed project would not be expected to result in adverse construction air quality impacts that would be appreciably more severe or greater in magnitude for EJ populations than for non-EJ populations.

  Moreover, the 2004 FEIS/EIR identified mitigation measures to reduce air quality effects to not adverse/less than significant. Because these mitigation measures were adopted and have been incorporated into the proposed project, and because this Final SEIS/EIR includes additional mitigation measures, construction impacts from exposure to air pollutants would be not adverse/less than significant. The same type, level, and quality of mitigation for these construction effects would be applied in both EJ and non-EJ communities (i.e., prepare and implement a construction emissions minimization plan as required by the City). With no adverse

effect following implementation of the mitigation measures, there would be no disproportionately high and adverse impact to EJ populations. In addition, the TJPA, as part of its 2017 Tunnel Options Study, has investigated other construction methods involving mined tunnel techniques that could reduce air emissions compared to the currently proposed cut-and-cover construction method. The identification of a preferred method will be made after the 30 percent Preliminary Engineering design, at which the point the TJPA will have evaluated and weighed the costs and benefits of the other construction techniques.

Based on the above analysis, adverse effects would affect both EJ and non-EJ communities. Impacts that would be predominantly borne by EJ populations include transportation delays and safety considerations, disturbance to paleontological resources during construction, potential ground settlement from construction, and exposure to construction and operational air emissions. All of these adverse effects on EJ and non-EJ populations would be similarly mitigated, so that there would be no disproportionately high and adverse effects on the EJ communities.

Impacts that would be appreciably more severe or greater in magnitude for minority and low-income populations than the impacts for non-minority or non-low-income populations include potential ground settlements from construction and exposure to operational air emissions. Both of these adverse effects on EJ and non-EJ populations would be similarly mitigated, so that there would be no disproportionately high and adverse effects on the EJ communities.

In summary, there would be no adverse effects on the above resource topics after the implementation of mitigation measures identified in the 2004 FEIS/EIR and this Final SEIS/EIR. Therefore, there would be no disproportionately high and adverse effects on EJ populations for these resource areas. ~~These resource areas are described further in Table 3.18-3.~~

~~In summary, t~~**Resource Topics with Adverse Effects After Mitigation.** The proposed project could have adverse construction noise effects at nighttime even with ~~associated with construction noise and vibration after~~ implementation of ~~recommended~~ mitigation measures. The nighttime construction noise effects would only occur if the City waives the restriction against construction between 8pm and 7am. These noise effects would be associated with the cut-and-cover construction technique and with activities that occur at the portals to the underground construction segments, such as the vent structure sites. The cut-and-cover construction method is proposed for the widened throat structure (Project Component #1 in Figure 3.18-1), the extended train box (Project Component #2), and the underground pedestrian connector (Project Component #12) at or in the vicinity of the new Transit Center.

As shown in Figure 3.18-1, the cut-and-cover construction would be used for the widened throat structure along Second Street, in the northern portion of the Transbay Redevelopment Plan area (census tract 615 block group 1), which does not have a high concentration of EJ populations, and also in the southern portion of this neighborhood (census tract 615 block group 2), which includes a minority EJ community. Cut-and-cover construction techniques are also proposed along Townsend Street and would include the Fourth and Townsend Street Station (Project Component #3) and the tunnel stub box (Project Component #5). In this area, the Yerba Buena portion of the SoMa neighborhood (census tract 180 block group 1, the Design District portion of the SoMa neighborhood (census tract 180 block group 2), and Mission Bay North (census tract 607 block group 1) include high concentrations of EJ populations. Residences along Townsend Street front onto the alignment proposed for cut-and-cover construction; whereas, the residences along Second Street are more distant. Different construction methods for the segment of the alignment along Townsend Street, such as tunneling, could lessen the construction noise effects for nearby EJ populations. Selection of a preferred construction method would occur after 30 percent Preliminary Engineering design. Nevertheless, as currently proposed, the construction noise impacts if during the nighttime would be predominantly borne by EJ populations. In addition, the EJ populations

would be closer to the cut-and-cover construction activities than the non-EJ populations. As a result, the proposed project would be expected to result in nighttime construction noise impacts appreciably more severe or greater in magnitude for EJ populations compared to non-EJ populations.

The vent structure sites proposed as portals for moving construction equipment, personnel, and materials are at Second and Harrison Streets and at Third and Townsend Streets; the former site is not within an EJ community and the latter site is an EJ community. Other staging areas include the widened throat structure, which is partially in an EJ area and partially in a non-EJ area, and the Caltrain railyard and the Fourth and Townsend Station area, both in areas with EJ populations. Considering all of these staging sites, nighttime construction would be borne predominantly by EJ populations. In addition, the EJ populations are closer to the staging areas than the non-EJ populations. As a result, nighttime construction noise impacts at staging areas would be appreciably more severe or greater in magnitude for EJ populations compared to non-EJ populations.

The 2004 FEIS/EIR identified mitigation measures to reduce construction noise impacts to not adverse/less than significant. However, that determination was made for daytime construction. Although the 2004 FEIS/EIR mitigation measures were adopted and have been incorporated into the proposed project and would be effective at reducing construction noise, nighttime construction would remain adverse/significant.

~~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. As defined in FTA's 2012 EJ Circular, a disproportionately high and adverse effect on an EJ~~environmental justice~~ population must take into account ~~is dependent on the net results after consideration of~~ the potential benefits of the proposed project. If after taking into consideration project benefits and weighing them against the disproportionate impacts on EJ populations, the benefits do not offset the impacts, FTA would determine that the project would result in disproportionately high and adverse effects on EJ populations.

The two stations proposed at Fourth and Townsend Streets and at the Transit Center would be within convenient walking distance of EJ populations. The Fourth and Townsend Station is surrounded by EJ populations. Likewise, the Transit Center is within convenient walking distance of EJ populations to the south of the station. This convenient access to major intermodal hubs provides access to other transit services, jobs, open space and recreation, social services, and education locally and within the region, because of the direct connection to transit providers that serve San Francisco, the Peninsula (San Mateo County), the South Bay (Santa Clara County), the North Bay (Marin and Sonoma Counties), and the East Bay (Alameda and Contra Costa Counties).

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 EJ~~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 the interconnected local, regional, and statewide bus and ~~these~~ rail transit systems would reduce overall vehicle miles traveled (VMT) with the associated benefits of reductions to criteria air pollutants and greenhouse gas emissions. The Metropolitan Transportation Commission Resolution #3434 was adopted to identify a Regional Transit Expansion Program of Projects. This resolution identified the "Caltrain Downtown Extension" (the DTX) as one of the region's priority transit and road projects. In July 2017, the Metropolitan Transportation Commission and the Association of Bay Area Governments jointly adopted 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 (RTPID 17-10-0038). 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. Based on the California Air Resources Board (CARB) calculator tool used to estimate greenhouse gas reductions, the DTX would result in reductions of 346,721 VMT in San Francisco in the opening year of DTX service to the Transit Center. This would yield GHG emissions reduction of 2,417,114 metric tons of CO2e in the first year of Caltrain ridership to the Transit Center. As a result, the proposed project would help attain local, regional, and state goals for improved sustainability and environmental quality.

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~~ The nighttime construction noise ~~and vibration~~ impacts would affect predominantly EJ~~environmental justice~~ communities along Townsend and Seventh Streets within the SoMa and Mission Bay neighborhoods, even with implementation of mitigation measures. The construction period is projected to be approximately 5 to 6 years. Offsetting this burden, the project would provide long-term benefits in terms of enhanced mobility, accessibility to local and regional transit services, and reduced air and greenhouse gas emissions would accrue equally to all residents in the project study area. The proposed Fourth and Townsend Street Station and Transit Center are within walking distance of the same EJ communities that would experience the construction impacts. Over the long term, EJ populations surrounding the stations would enjoy improved access to employment and recreation facilities in the City and throughout the larger Bay Area. ~~in the vicinity of the realigned Fourth and Townsend Street 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 on low-income and minority populations would not be ~~borne~~ considered disproportionately high and adverse, because the effects would not be suffered primarily by environmental justice communities after consideration of mitigation measures, ~~and~~ the adverse effects would be experienced only during the construction period at nighttime, ~~compared to~~and the long-term benefits of increased mobility and reduced air quality and greenhouse gas emissions would accrue to all populations in the project study area and offset the temporary nighttime construction effects.

Table 3.18-3
Analysis of Disproportionately High and Adverse Effects on ~~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 and access to properties. Construction methods that excavate and construct the tunnel from under the street surface would reduce these street-level circulation and access impacts. 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 and New-MM-TR-3.1, 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 and New-MM-TR-3.1, traffic operations would be maintained at established acceptable levels, and safe pedestrian and bicyclist conditions would be provided. These new mitigation measures in combination with the mitigation measures from the 2004 FEIS/EIR would reduce the transportation impacts to not adverse. As a result, ~~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~~ disproportionately high and adverse transportation impacts on environmental justice communities would not occur.
Socioeconomics, Population, and Housing	The proposed project would result in temporary construction impacts that would interfere with local circulation, social and economic interactions, and access to community facilities. Construction methods that excavate and construct the tunnel from under the street surface would reduce these street-level circulation impacts. 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,~~ No short-term or long-term adverse socioeconomic impacts were identified. As a result, ~~and no~~ disproportionately high and adverse socioeconomic effects on ~~an~~ environmental justice communities~~y~~ would not occur.
Visual Quality/ Aesthetics	A potential exists for new sources of light at the intercity bus facility to adversely affect surrounding land uses, but would be subject to the DTX Design Criteria and City regulations regarding building materials that would reduce light and glare to not adverse. Implementation of Mitigation Measure VA 1 from the 2004 FEIS/EIR would minimize spillover lighting associated with construction activities to the extent possible.	~~Potential adverse light and glare effects would be mitigated,~~ No short-term or long-term adverse impacts to scenic resources, scenic vistas, or visual quality were identified. As a result, ~~and no~~ disproportionately high and adverse visual effects on an environmental justice community would not occur.
Historic and Cultural Resources	The proposed project could result in discovery of archaeological resources during construction activities. ~~Modification of~~ pPreviously adopted mitigation measures from the 2004 FEIS/EIR have been incorporated and memorialized in an MOA that stipulates measures that would avoid and minimize potential effects. Specifically, for each proposed project area involving ground disturbance, a new or amended ~~require the development and implementation of an updated~~ archaeological research design and treatment plan ~~that~~ would be prepared to identify, evaluate and, where necessary, define measures to avoid or minimize potentially adverse effects. Similarly, the MOA identifies protective measures to avoid and minimize effects to architectural historic resources and districts.	Potential adverse effects to cultural ~~and paleontological~~ resources would be avoided. As a result, the short- and long-term historic and cultural resources impacts of the proposed project would not be adverse. Therefore, ~~mitigated, and no~~ disproportionately high and adverse cultural effects of the proposed project on ~~an~~ environmental justice communities~~y~~ would not occur. Potential adverse effects to paleontological resources would also be mitigated, so that short- and long-term impacts of the proposed project would not be adverse. Therefore, disproportionately high and adverse paleontological effects on environmental justice communities would not occur.

Table 3.18-3
Analysis of Disproportionately High and Adverse Effects on ~~Executive Order 12898~~ ~~(~~Environmental Justice Communities~~)~~

Environmental Resource	Impacts Summary	Relevance to Environmental Justice
	~~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.	
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 during construction would be mitigated and no long-term adverse effect was identified for special status species, wetlands or other sensitive natural habitats, or migratory wildlife populations. As a result, the short- and long-term biological resources impacts of the proposed project would not be adverse. Therefore, ~~and no~~ disproportionately high and adverse biological effects on ~~an~~ environmental justice communities~~y~~ would not occur.
Water Resources and Water Quality	The proposed project's construction activities under all construction methods under consideration 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~~.~~. As a result, the short- and long-term water resources and water impacts of the proposed project would not be adverse. Therefore, ~~and no~~ disproportionately high and adverse water quality effects on ~~an~~ environmental justice communities~~y~~ would not occur.
Geology, Soils, and Seismicity	The proposed project's construction activities under all construction methods under consideration could result in adverse effects related to settlement where groundwater may be encountered. Implementation of mitigation measures previously identified in the 2004 FEIS/EIR in combination with New-MM-C-GE-4.1 would provide for ground stability and avoid this adverse effect.	Potential adverse effects related to ground settlement would be mitigated. As a result, the short- and long-term geology, soils, and seismicity impacts of the proposed project would not be adverse. Therefore, disproportionately high and adverse geology effects on environmental justice communities would not occur.
Hazardous Materials	The proposed project's construction activities under all construction methods under consideration 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.~~ No short-term or long-term adverse effects related to routine use, transport, or disposal of hazardous materials; accidental releases during operations; or interference with emergency response were identified. As a result, ~~and no~~ disproportionately high and adverse hazardous materials effects on ~~an~~ environmental justice communities~~y~~ would not occur.

Table 3.18-3
Analysis of Disproportionately High and Adverse Effects on ~~Executive Order 12898~~ ~~(~~Environmental Justice Communities~~)~~

Environmental Resource	Impacts Summary	Relevance to Environmental Justice
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~~,~~. As a result, the short- and long-term electromagnetic impacts of the proposed project would not be adverse. Therefore, ~~and no~~ disproportionately high and adverse electromagnetic effects on ~~an~~ environmental justice communities~~y~~ would not occur.
Noise and Vibration	The proposed project could result in an adverse impact related to construction ~~operational~~ noise and vibration if a waiver is issued by the City to perform construction activities at night. Construction noise and vibration under all construction methods under consideration would be minimized with implementation of mitigation measures from the 2004 FEIS/EIR. Those construction methods that excavate and construct the tunnel from under the street surface would further reduce the noise impacts for sensitive receptors along the segments where these different techniques could be used.~~; however,~~ Regardless of the construction method, 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 during operations 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 along ~~throughout~~ the project alignment which lies predominantly within or adjacent to ~~area and would 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, construction of a segment of the alignment along Townsend Street, 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, t~~These temporary ~~adverse~~ nighttime construction noise effects, would ~~not~~ be ~~disproportionately~~ predominantly borne by environmental justice populations and appreciably greater in magnitude because of the proximity of the EJ populations to the construction activities. Taking into consideration mitigation measures from the 2004 FEIS/EIR and the long-term benefits of the proposed project, the temporary nighttime construction noise effect would not be disproportionately high and adverse. All other potential adverse noise and vibration effects would be mitigated~~,~~. As a result, short- and long-term noise and vibration impacts of the proposed project, excluding nighttime construction described above, would not be adverse. Therefore, ~~and no~~ disproportionately high and adverse operational and daytime construction noise and vibration effects on ~~an~~ environmental justice communities~~y~~ would not occur.

Table 3.18-3
Analysis of Disproportionately High and Adverse Effects on ~~Executive Order 12898~~ ~~(~~Environmental Justice Communities~~)~~

Environmental Resource	Impacts Summary	Relevance to Environmental Justice
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 under all construction methods under consideration would generate significant oxides of nitrogen (NO_X) emissions. In addition, construction activities would generate toxic air contaminants, including particulate matter and diesel particulate matter. Those construction methods that excavate and construct the tunnel from under the street surface would further reduce the dust generation due to ground disturbance and truck trips hauling excavated soil materials. 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.	Potential adverse air quality effects would be mitigated, and long-term reduction of regional air emissions attributable to the proposed project would be a beneficial effect. As a result, the long-term air quality impacts of the proposed project would not be adverse. ~~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, construction of a segment of the alignment along Townsend Street, 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 well as all other proposed project construction sites.~~These effects would be predominantly borne by EJ populations and appreciably greater in magnitude for EJ populations compared to non-EJ populations, because the EJ populations would be closer to the construction. These construction air quality impacts would be mitigated with measures from the 2004 FEIS/EIR as well as those identified in this SEIS/EIR. Therefore, disproportionately high and adverse ~~construction~~ air quality effects~~, which would be mitigated, would not be disproportionately borne by~~ on environmental justice communities ~~populations~~ would not occur.
Utilities	The proposed project could adversely impact underground utilities during construction, resulting in possible disruption of service to customers. Those construction methods that excavate and construct the tunnel from under the street surface would reduce the potential for service interruptions, because the construction work would occur below most utilities. 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.~~ No short-term or long-term adverse utility effects were identified. As a result, ~~and no~~ disproportionately high and adverse utility effects on ~~an~~ environmental justice communities~~y~~ would not occur.

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~~,~~ or low-income ~~and transit dependent~~ environmental justice communities. The proposed project analyzed in this SEIS/EIR could result in new adverse nighttime construction noise effects not identified in the 2004 FEIS/EIR; however, these effects would not be disproportionately borne by environmental justice populations with implementation of mitigation measures and consideration of the benefits that would accrue to all populations as a result of the project. ~~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.	

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2.20 UPDATED CHAPTER 6, SECTION 4(f) EVALUATION

Chapter 6, Section 4(f) Evaluation is reproduced below as a final Section 4(f) assessment, incorporating comments on the draft assessment included in the Draft SEIS/EIR and concurrence from the State Historic Preservation Officer on the finding of effect to historic resources.

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] 303~~ and 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 Final ~~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 Streets 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 was ~~has been~~ notified of the FTA's intent to make a de minimis impact determination. ~~If the~~ SHPO concurrences~~, the FTA will issue determinations of de minimis impact as part of the Final Section 4(f) Evaluation~~ is reflected herein~~ 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 when the proximity impacts of a transportation project on a Section 4(f) property, even without acquisition of the property, are so great that the activities, features and attributes of the property are substantially impaired.

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.

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 the~~is~~ Draft 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 Section 2.4, Updated Section 2.2 Project Alternatives, of this Final SEIS/EIR). 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, design, and construction details ~~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.

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 of Section 4(f) Resource ~~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 Streets 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

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

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

Approved Phase 2 Transbay Program Components (No Action Alternative)	Proposed Project
• 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 • Emergency exit shafts at Second and Brannan Streets, and Second and Howard Streets	• 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 - One vent structure each at Third and Townsend Streets (two options were identified in the Draft SEIS/EIR but the site at the northeast corner is now the preferred and only location) 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	

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 2010~~09~~ and 2016, 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 the~~is

~~Draft SEIS/EIR.~~ A final finding of effect (Appendix B.1) and letter requesting concurrence of the finding of effect (Appendix B.2) was sent to SHPO on February 17, 2017. Concurrence from SHPO was received that the proposed project would not result in additional adverse effects to built environment properties and that there should be continued consultation to determine the appropriate course of action for protection of archaeological resources. This letter is included as Appendix B.3 of this Final 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.

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.

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

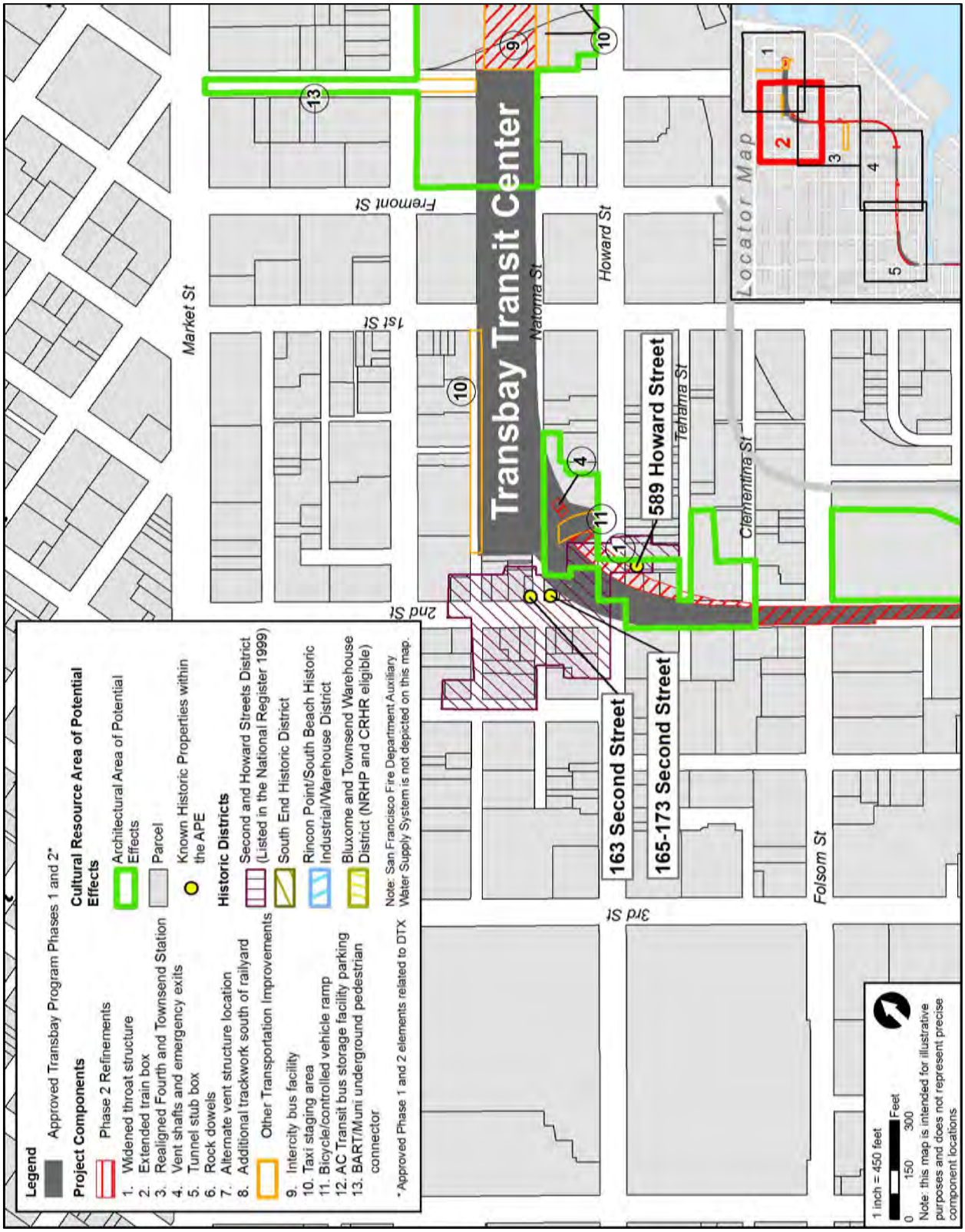
Historic District Name	Eligibility Status
Second and Howard Streets Historic District	NRHP Historic District
Rincon Point/South Beach Historic Warehouse-Industrial District	NRHP-Eligible Historic District; CRHR-Eligible Historic District
South End Historic District	San Francisco Article 10 Historic District; 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	

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).

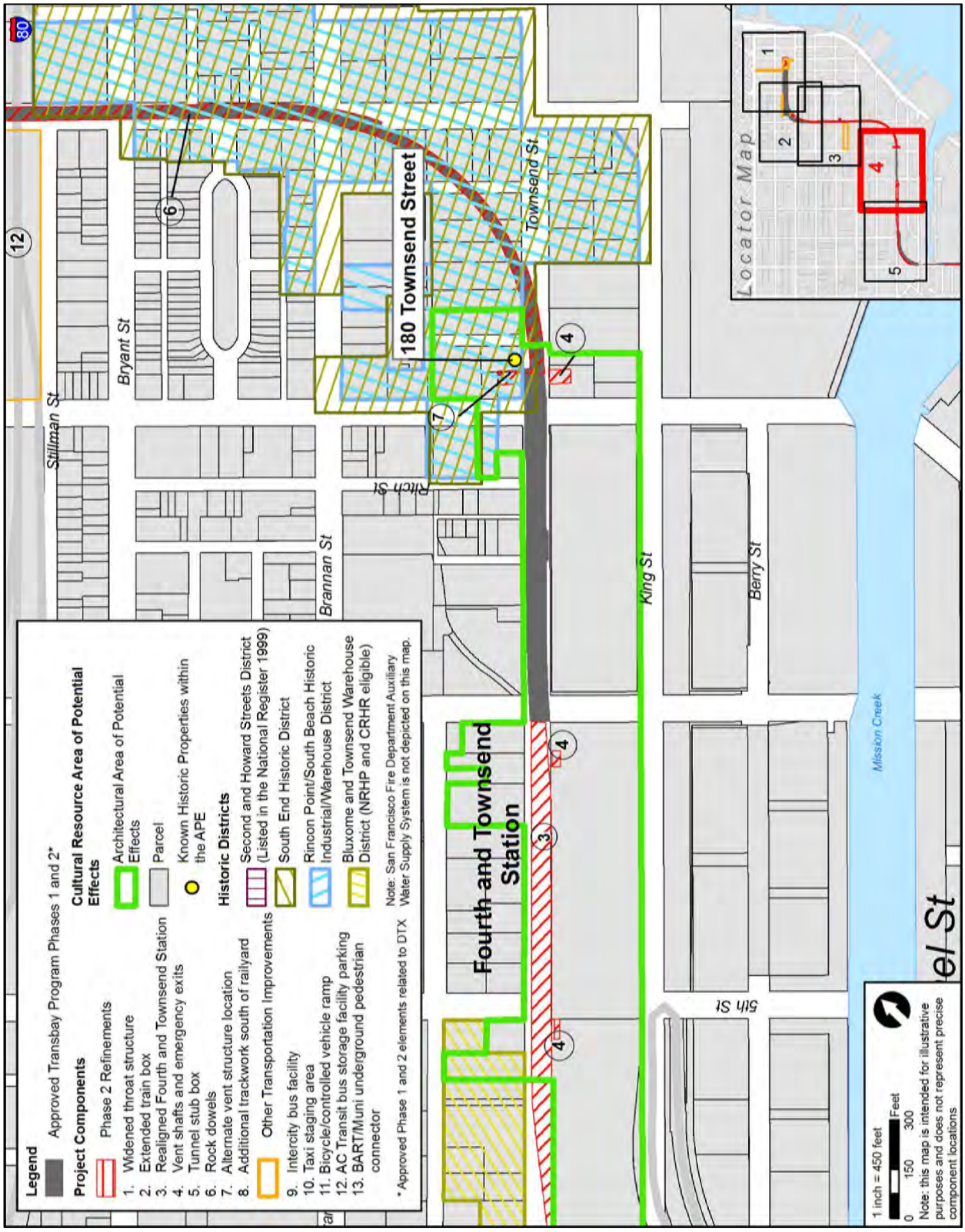
Rincon Point/South Beach Historic Warehouse-Industrial District

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



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)

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.

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 San Francisco Historic Preservation Commission (Motion 0103) in December 1, 2010 adopted an augmentation survey that included the South End Historic District extension. The area encompassed within this boundary extension included 19 properties, 12 of which are contributing. The boundaries of the South End Historic District are nearly identical to the Rincon Point/South Beach Historic Warehouse-Industrial District. With this boundary adjustment, the number of properties in this district now totals 97 buildings, of which 67 are contributing buildings.

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~~ Appendix B.1 of this Final 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, of the Draft SEIS/EIR. 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, of the Draft SEIS/EIR, 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,~~ Where use has been identified (see Table 6-5), FTA has determined that the impacts would be de minimis. This determination was based on ~~FTA has received written~~ concurrence from the SHPO that there would be no adverse effect to historical resources, and on ~~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~~, 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, along with FTA's use determination.

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 Streets 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

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, which is now the preferred site for this facility, 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 and Rincon Point/South Beach Historic Industrial Warehouse 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); this non-contributor designation also applies to the Rincon Point/South Beach Historic Industrial Warehouse District.

As discussed further in Appendix B.1~~G.2~~ of this Final SEIS/EIR, the demolition of one contributor and one non-contributor would not result in a substantial impact on the South End Historic District and Rincon Point/South Beach Historic Industrial Warehouse District because the historical integrity of the districts would remain intact ~~strong as a whole~~, with ~~55~~ the remaining contributors continuing to be a high percentage of the total number of buildings in the districts, and because the visual and character of the remaining ~~with the retention of a strong~~ row of contributing buildings east of 180 Townsend to Second Street and to the north along Third Street would continue to convey the districts' significance. ~~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 districts ~~could~~ would introduce a new building element that could alter the character and feeling of the other nearby contributor buildings; however, the TJPA will require that the new design follows guidelines protective of the historic character of the area such as the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. ~~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, which is now the preferred site, 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 Districts, 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 integrity of a historic district. The demolition of one contributor in the southwest corner of the districts would not result in an adverse effect on the Rincon Point/South Beach and South End Historic Districts, because the historical integrity of the districts would remain intact ~~strong as a whole~~, with ~~54~~ the remaining contributors being a high percentage of the total number of buildings in the districts. Furthermore, ~~and with~~ the retention of a strong row of contributing buildings to the east of 180 Townsend to Second Street and to the north along Third Street would maintain the visual appearance, setting, and feeling along these borders of the districts. Based on the minor effect of the loss of one contributing building in ~~a~~ these historic districts ~~made up of more than 55 contributors~~, and the application of mitigation measures from the 2004 FEIS/EIR, 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 important features, activities, ~~and~~ or attributes that qualify the Historic Districts 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.~~ SHPO provided concurrence on the no adverse effect determination for this historic resource under Section 106; the letter of concurrence is included as Appendix B.3 of this Final SEIS/EIR. ~~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~~. After consideration of measures to minimize harm, consultation with SHPO as the official with jurisdiction over this property, and SHPO's concurrence regarding the no adverse effect finding, there would be a de minimis impact to this Section 4(f) historic resource. With SHPO's concurrence on FTA's finding of no adverse effect on the Historic Districts and measures to minimize harm, there would be no substantial impairment. Therefore, there would also be no constructive use resulting from the demolition of one non-contributing building (689-699 Third Street) and one contributing building (180 Townsend Street).

~~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**s** 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~~ described 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~~ D of this Final~~e Draft~~ 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. Nevertheless, the tunnel would pass under a portion of the building and require a permanent easement.

The above construction activities and use of the 589 Howard Street property are based on a cut-and-cover construction technique. A different construction method, the jacked box tunnel technique, as described in Section 2.4 of this Final SEIS/EIR, is also under consideration to help reduce construction-related street-level disruption associated with cut-and-cover construction. Mining this portion of the tunnel using this other construction method would still require underpinning the building, but the underpinning could be integrated into the tunnel support and would reduce potential physical damage to this building. This method would require less work than the underpinning of the building with the cut-and-cover construction method. To underpin the building with a mined tunnel, additional pipes would be pushed horizontally under 589 Howard Street from the excavation to the west of the building to support the building.

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~~ D of the~~is~~ Final 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 using either the cut-and-cover or the jacked box tunnel method, ~~which would result in the use of the historic 589 Howard Street building~~. Construction and a permanent easement for the widened throat structure would not require the permanent incorporation of this Section 4(f) property into the proposed project. Nevertheless, a~~A~~ possibility would exist for~~of~~ unanticipated damage to the building during construction of the underpinnings. Any such damage could affect the integrity of ~~the historic~~ this contributor structure. Mitigation Measures CH 11, CH 12, and CH 13, previously ~~approved from~~ identified in the 2004 FEIS/EIR and adopted and incorporated into the Transbay Program, would reduce this effect, and the effects determination reached in the 2004 FEIS/EIR would not change. With implementation of the minimization and avoidance measures listed in Appendix D of this Final SEIS/EIR, construction and a permanent easement at 589 Howard Street for the widened throat structure would not alter the character-defining features of the Second and Howard Streets Historic District, including the brick cladding, restrained brick ornamentation, and rhythmic fenestration pattern of the Howard Street facade. ~~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.~~ SHPO provided concurrence on the no adverse effect determination under Section 106 for this historic resource; the letter of concurrence is included as Appendix B.3 of this Final SEIS/EIR. ~~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.~~ After consideration of avoidance measures to minimize harm; including measures related to vibration; consultation with SHPO as the official with jurisdiction over this property; and SHPO's concurrence

regarding the no adverse effect finding, there would be a de minimis impact to this Section 4(f) historic resource, and potential effects would not adversely affect the features, attributes, or activities that qualify the property for protection under Section 4(f).

The widened throat structure would pass under and be within the boundaries of the Second and Howard Streets Historic District. However, the structure's location and operational characteristics would not result in a constructive use that could substantially impair the important features, activities, or attributes that qualify this district for protection under Section 4(f). The structure would be underground and, therefore, would not visually detract from the character, feeling, and attributes of the historic district or affect access to or circulation around the district. As described above, Mitigation Measures CH 11, CH 12, and CH 13 would reduce potential impacts to historic features and attributes; Mitigation Measures SG 1, SG 2, SG 4, and SG 5, previously adopted and incorporated into the Transbay Program, would minimize soil and geotechnical hazards to adjacent buildings; and VibC 1, VibC 2, and VibC 3, also previously adopted and incorporated into the Transbay Program, would minimize vibration effects to adjacent buildings. Because potential indirect impacts to the Second and Howard Streets Historic District were mitigated by measures previously adopted as part of the 2004 FEIS/EIR, the widened throat structure would not result in substantial impairment to the important features, activities, or attributes that qualify the district for Section 4(f) protection and there would be no constructive use of this Section 4(f) property.

~~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 the cut-and-cover 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 because a portion of the widened throat structure would pass under and encroach into the area underneath the building at 165-173 Second Street, 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.

As described above for 589 Howard Street, this Final SEIS/EIR identifies a different construction method, the jacked box tunnel technique, at the Howard Street crossing only. The limits of construction for this other construction method would not extend to the property at 165-173 Second Street. This other construction method would reduce some of the proximity effects (noise, dust, and circulation) that would otherwise occur with cut-and-cover construction, although the reduction in effects would be highly localized and confined to the Howard Street crossing. Overall, it would have no direct or indirect effect on the important features, activities, or attributes that qualify the Second and Howard Streets District for protection under Section 4(f), if used in lieu of cut-and-cover construction.

~~**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. Construction and a permanent easement for the widened throat structure would not require the permanent incorporation of this Section 4(f) property into the proposed project. Nevertheless, a~~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 the implementation of these minimization and avoidance measures, the construction and a permanent easement would not alter the character-defining features of the Second and Howard Streets Historic District, including the brick cladding, restrained brick ornamentation, and rhythmic fenestration pattern of the Howard Street facade. With application of 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 165-173 Second Street and would~~ have no adverse effect on 165-173 Second Street or the Second and Howard Streets District. ~~Therefore, a de minimis impact finding for the proposed project on these Section 4(f) historic resource and districts would be appropriate.~~ SHPO provided concurrence on the Section 106 no adverse effect determination for this historic resource; the letter of concurrence is included as Appendix B.3 of this Final SEIS/EIR. ~~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.~~ After consideration of the avoidance and minimization measures; consultation with SHPO as the official with jurisdiction over this property; and SHPO's concurrence regarding the no adverse effect finding, there would be a de minimis impact to this Section 4(f) historic resource, and potential effects would not adversely affect the features, attributes, or activities that qualify the property for protection under Section 4(f).

Conditions that currently exist with respect to the visual, noise, circulation, and other features in the vicinity of this Section 4(f) property would not change, because the building at 165-173 Second Street would be preserved under the proposed project, including the other construction technique under consideration for the widened throat structure. As a result, there would be no substantial impairment to the features, activities, or attributes that qualify the Second and Howard Streets Historic District for protection under Section 4(f), and there would be no constructive use of this Section 4(f) property.

~~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. The jacked box tunnel technique, as described in Section 2.4 of this Final SEIS/EIR, is proposed only for the Howard Street crossing and, similar to 165-173 Second Street, the construction limits for this

other construction method would not extend to the property at 163 Second Street. This other construction method would reduce some of the proximity effects (noise, dust, and circulation) that would otherwise occur with cut-and-cover construction, although the reduction in effects would be highly localized and confined to the Howard Street crossing. Overall, it would have no have direct or indirect effect on the important features, activities, or attributes that qualify the Second and Howard Streets District for protection under Section 4(f), if used in lieu of cut-and-cover construction.

~~Preliminary~~ Section 4(f) Use Determination. The proposed widened throat structure would allow 165-173 Second Street to remain extant and would not require use of this property. ~~and would result in a beneficial change in use as a result of the proposed project.~~ As a result, ~~T~~there would be no change in the setting of the neighboring building at 163 Second Street, which is a contributor to the Second and Howard Streets Historic District, and there would be no permanent incorporation of the building into the project. The project would not substantially impair the features, activities, or attributes that qualify the district for protection under Section 4(f). ~~and~~ Therefore, ~~the FTA's preliminary determination is that~~ the proposed project, including the other construction technique under consideration, would have ~~no effect on 163 Second Street and the Second and Howard Streets District~~. ~~N~~no Section 4(f) permanent use or constructive use of the 163 Second Street building or the Second and Howard Streets Historic District~~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) permanent 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. The proposed station entrances and 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. The new structures would be constructed at a sufficient distance from the historic district to avoid impeding sight lines from most of the historic district to the railyard, which is several blocks long with an approximately 800-foot frontage along Townsend Street. These proposed facilities would not severely alter access to or circulation around the historic district. Furthermore, potential noise impacts from the

vent structures would be mitigated by New-MM-NO-1.1 which would maintain noise levels at or below the APTA recommended noise level of 60 dBA for ancillary facilities in high-density residential areas. ~~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.~~ SHPO provided Section 106 concurrence on the no adverse effect determination for this historic resource; the letter of concurrence is included as Appendix B.3 of this Final SEIS/EIR. The proximity impacts from construction and operation of the proposed project would not substantially impair the features, activities, or attributes of the property that qualify it for protection under Section 4(f). The proposed project would therefore not result in constructive use of the Bluxome and Townsend 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. Replacement of a relatively small segment of pipe under any of the various construction methods (due to conflicts with the construction activities or damage to old and brittle pipes) within a total of 135 miles of pipes citywide and taking another segment out of service (together totaling less than 1 mile) would not substantially impair the features, activities, and attributes that qualify the AWSS for Section 4(f) protection. ~~Therefore, a de minimis impact finding for the proposed project on this historic district would be appropriate.~~ SHPO

provided concurrence on the no adverse effect determination for this historic resource; the letter of concurrence is included as Appendix B.3 of this Final SEIS/EIR. ~~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.~~ After consideration of the measures to minimize harm; consultation with SHPO as the official with jurisdiction over this property; and SHPO's concurrence regarding the no adverse effect finding under Section 106, there would be a de minimis impact to this Section 4(f) historic resource.

~~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~~ or 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. Furthermore, no Section 4(f) constructive use would occur, because there are no characteristics of the proposed project that would substantially impair the important features, activities, or attributes associated with the public parks and recreational facilities that qualify them as Section 4(f) properties.

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 and Rincon Point/South Beach Historic Industrial Warehouse 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). Temporary construction to install the underpinnings at 589 Howard and 165-173 Second Streets and to construct other underground components near or at AWSS pipes and infrastructure would not result in a permanent reduction, loss, or substantial impairment of the respective districts. 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. There would be no constructive use of any of these Section 4(f) resources.

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 the~~is~~ Draft SEIS/EIR. A final findings of effect (Appendix B.1) and letter requesting concurrence of the finding of effect (Appendix B.2) was sent to SHPO on February 17, 2017, which report that the effect of the overall Transbay Program (i.e., the Section 106 undertaking) remains adverse; however, the proposed project (i.e., refinements to the Transbay Program and additional transportation improvements that meet the project's purpose and need) would not result in adverse effects or any additional adverse effects beyond those previously analyzed. Concurrence from SHPO was received that the proposed project would not result in additional adverse effects to built environment properties and that there should be continued consultation to determine the appropriate course of action for protection of archaeological resources. This letter is included as Appendix B.3 of this Final SEIS/EIR.

Consistent with 49 USC 303, copies of the Draft Section 4(f) evaluation ~~will be~~ were made available as part of the Draft 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 and a summary of the findings will be part of FTA's Record of Decision (ROD).

2.21 UPDATED SECTION 7.6, CONSULTATIONS PURSUANT TO FEDERAL ACTS AND ENVIRONMENTAL LEGISLATION, AND SECTION 7.7, SUMMARY OF PUBLIC INVOLVEMENT AND NEXT STEPS

Section 7.6, Consultations Pursuant to Federal Acts and Environmental Legislation, and Section 7.7, Summary of Public Involvement and Next Steps, are reproduced below and are amended to include further consultation with the State Historic Preservation Officer and a description of the public review of the Draft SEIS/EIR.

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 Final SEIS/EIR, which updates the preliminary Section 4(f) evaluation that was included in the Draft SEIS/EIR as Chapter 6.

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.~~ A Notice of Preparation, informing the SHPO that an environmental document was being prepared for the proposed project, was issued in April 2013. 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.

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 of the Draft SEIS/EIR). SHPO concurrence on the Areas of Potential Effect and inventory of historic resources was received on December 8, 2015 (see Appendix G.1 of the Draft SEIS/EIR). Preliminary conclusions regarding effects to these resources are presented in Appendix G.2 and summarized in

Section 3.6, Historic and Cultural Resources, of the Draft SEIS/EIR. A final finding of effect (Appendix B.1 of this Final SEIS/EIR) and letter requesting concurrence of the finding of effect (Appendix B.2 of this Final SEIS/EIR) was sent to SHPO on February 17, 2017. Concurrence from SHPO was received that the proposed project would not result in additional adverse effects to built environment properties and that there should be continued consultation to determine the appropriate course of action for protection of archaeological resources. This letter is included as Appendix B.3 of this Final SEIS/EIR.

Native American groups and individuals that were identified by the Native American Heritage Commission (NAHC) were contacted in 2015 to request information or concerns regarding the proposed project. Seven of the nine individuals on the list provided by the NAHC were successfully contacted, and two of them requested that a Native American monitor be present during project construction. As of June 2016, no new information on cultural resources within the Areas of Potential Effect has been provided as a result of Native American consultation.

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 made available for public review and comment ~~distributed~~ on December 28, 2015. Copies of the Draft SEIS/EIR were provided to local, state, and federal agencies, ~~and interested community groups~~ organizations and individuals (see Chapter 10, Distribution List). A copy of the Draft SEIS/EIR was also posted on the TJPA website. A~~n approximately~~ 60-day public review period was~~will be~~ held to receive comments on the Draft SEIS/EIR, ~~which will extend~~ from December 28, 2015 to February 29, 2016. The TJPA held ~~will hold~~ a public meeting to receive public comments during the comment meeting 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 meeting ~~hearing~~ was~~will be~~ made using methods similar to those used for the Scoping Meeting. In addition to comments received at the public meeting ~~hearing~~, TJPA ~~will~~ accepted written comments on the Draft SEIS/EIR and email comments sent to the FTA and the TJPA.~~following addresses:~~

~~Brenda Perez~~
~~Federal Transit Administration~~
~~Region 9 Office~~
~~90 7th Street, 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.~~ Appendix A of this Final SEIS/EIR includes copies of the comments received during the public review period on the Draft SEIS/EIR and responses to these comments. Twenty-two comment submittals including about 153 individual comments were received: 2 submittals from federal agencies, 4 from state agencies, 3 from local agencies, and 13 from individuals and organizations. In addition, three comment letters from individuals and organizations were received after the close of the public review period and have been included and responded to in Appendix A.

~~Upon completion of the Final SEIS/EIR, the FTA and TJPA will publish a notice of its availability~~. In accordance with CEQA requirements, responses to comments from public agencies were provided to those

agencies at least ten days in advance of certification of the SEIR by the TJPA Board. ~~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.~~ For this project, after the consideration of comments received during and after the circulation of the Draft SEIS, FTA determined that practicality considerations preclude the issuance of a combined Final SEIS/ROD. Accordingly, FTA has approved this Final SEIS, in accordance with 23 CFR 771.125, and issued it for a 30-day public review. After the review period, FTA will render its decision regarding the project. Project approval will be issued in an Amended ROD (amended because it revises the 2005 FTA ROD for the original project). ~~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.~~

2.22 UPDATED CHAPTER 8, REFERENCES FOR CHAPTER 1, PURPOSE AND NEED, CHAPTER 2, PROJECT ALTERNATIVES, SECTION 3.2 TRANSPORTATION, SECTION 3.3 LAND USE AND PLANNING, WIND, AND SHADOW, SECTION 3.6 HISTORIC AND CULTURAL RESOURCES, SECTION 3.12 NOISE AND VIBRATION, SECTION 3.13 AIR QUALITY, AND SECTION 3.18 ENVIRONMENTAL JUSTICE COMMUNITIES

New references are included in Chapter 8, References, but only affect those cited in Chapter 1 Purpose and Need, Chapter 2 Project Alternatives, and Sections 3.2 Transportation, 3.3, Land Use and Planning, Wind, and Shadow, 3.6 Historic and Cultural Resources, 3.12 Noise and Vibration, and 3.13 Air Quality.

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